Established 1914

May 1932

CHEMICAL MARKETS

VOLUME XXX NUMBER 5

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CHEMICAL MARKETS, Inc., Publishers

Publication Office, 28 Renne Ave., Pittsfield, Mass. Editorial and General Office, 25 Spruce St., New York City

WILLIAMS HAYNES, PRESIDENT; H. H. ADAMS, VICE-PRESIDENT; WILLIAM F. GEORGE, SECRETARY-TREASURER

PUBLISHED ON THE TENTH DAY OF EACH MONTH AT PITTSFIELD, MASS. SUBSCRIPTION, DOMESTIC, TWO DOLLARS FIFTY CENTS A YEAR, IN ADVANCE, CANADIAN AND FOREIGN, THREE DOLLARS; SINGLE COPIES, CURRENT ISSUE, 25 CENTS; BACK COPIES, 50 CENTS EACH. NOTICE OF THREE WEEKS IS NECESSARY TO CHANGE SUBSCRIBER'S ADDRESS AND IN WRITING PLEASE GIVE BOTH THE OLD AND NEW ADDRESSES. PRINTED FOR THE PUBLISHERS BY THE SUN PRINTING COMPANY, PITTSFIELD, MASS. ENTERED AS SECOND CLASS MATTER, JANUARY 1, 1928 AT THE POST OFFICE AT PITTSFIELD, MASS. UNDER THE ACT OF MARCH 3. 1879.

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What Do We Mean---Research?

IT IS a good American habit to take up a nice new word and to use it constantly and carelessly till we stretch its meaning all out of shape. There comes a time when, if we are to use that abused word with any precision, it is necessary to define it or run the risk of being misunderstood. Thus when the soda-jerker who counts the frosted banana splits he serves during the week and the chemist who counts the electrons in chromium are both "conducting a research," it is difficult to know just what "research" means. And this over-worked word is now applied not only to counting anything from sundaes to subatomics, but also to all sorts of inquiries into everything from the analysis of a distant star to the motives of the hen who crossed the road.

IN THE domains of chemistry the meaning of "research" is important. In chemical science this necessity is self-evident; but in chemical commerce too, without a clear understanding of what "research" is, it is impossible to know what it can, and cannot, accomplish.

OUR pressed and fearful industrialists display a perfectly human tendency to damn research. Over-production, new processes, new products have helped disturb markets and disrupt price structures, and it is not impossible to blame research for many of our difficulties. It is human to do so and perfectly natural too, since a well-organized, well-supported propaganda has been "selling the research idea" until in many directions it has been over-sold.

THE pity of it is that this reaction against research springs very largely from abuse. But a fraction of the testing, checking, counting inquiries charged up to research expenses should be placed in that account. A pretty brick building with LABORATORY cut over the door and a nice bed of geraniums in the lawn is not of necessity the home of research and even a dozen Ph. D. chemists do not surely constitute a research staff. To furnish talking points for the advertising department or to dress windows for Wall Street's approval are not sound research objectives and it is not research at all to go price shopping or to recheck data already compiled and codified.

TRUE research, on the other hand, is vital in chemical industries. We are thoroughly committed to technological advances and no chemical company can afford to block progress either by neglecting or suppressing the results of research. As a matter of fact, work of this kind is the strongest defense in the competitive battle, and it is therefore especially important that our executives have a practical, working definition of chemical research, its ways and means, and its real objectives.

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Diamond Alkali Company

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Price Stabilization Dr. Marks' review of "Cartels in Depression" which we published in our February issue has been strikingly confirmed by a survey recently published by the Department of Commerce. The conclusion is plain: the international cartel has failed as a stabilizing factor either for the pegging of prices or the reduction of over-production and in the present economic crisis its influence has dwindled to insignificance.

Encouraged by several European governments, backed by enormous resources, combining often as much as 90 per cent of the output, many of us in the United States have looked with longing eyes at what seemed to be the beau ideal market stabilizer. The weakness in their control over their own members would appear to have been more than compensated by the very keen self-interest of all and the failure of this device indicates plainly that we can exert only a very partial and very incomplete control over supply and demand in the chemical field.

So thorough-going a demonstration of the force of basic economic laws must raise doubt as to the wisdom of many of our best and most strenuous efforts. Most plainly it suggests that in the times of a major economic readjustment, the producer who attempts to hold up prices, the labor union who refuses to accept wage cuts, the legislature who fails to reduce government expense and lower taxes, are all holding up reconstructive forces and in the long run increasing the difficulties of the depression period. Instead of endeavoring to maintain *status quo* efforts may be better directed to adjusting upon the new basis.

"Chiseling" In times of stress, weaknesses develop, and present market conditions have strained some of these weak links in the business chain to the breaking point. An ancient evil of the paint industry—the exchange of paint stocks— is said to be increasingly common after this practice had been almost entirely eliminated. Chemical dealers are falling into the temptation to give regular customers carload prices on mixed orders. Some distributors and producers too, are even forgetting that there is a very real difference in their own costs between an f. o. b. and a delivered transaction. The commonly unsatisfactory condition of returnable containers has slipped into a more and more demoralized and dangerous method of price shaving. But twisting the old proverb around it is not always the seller who is to blame, and there are plenty of real practices cropping up among buyers who depress the price by playing one salesman off against his competitor. As Bacon wrote several centuries ago: "The virtue of prosperity is temperance; the virtue of adversity is fortitude. . . Prosperity doth best discover vice, but adversity doth best discover virtue."

A Yardstick For Candidates We are not a political organ, but with the coming presidential election and the close inescapable economic results of political action these days, we want to make a political suggestion. During the next few months a number of very different candidates are going to parade before us their qualifications for the presidency. As is their custom, they will deal chiefly in glittering generality, but this is a time when it is particularly important to know exactly what the chief executive of this country believes, and what he proposes to do on the following problems:

1. An American monetary policy.
2. Taxes.
3. Balancing the Federal budget.
4. Foreign debts and reparations.
5. Unemployment relief.

Let us not be deceived by such high-sounding phrases as "the restoration of American standard of living," "safe-guarding of our economic well-being," "a plan for prosperity." American people want the facts and have a right to demand a definite statement of plans and policy.

A House In Order No division of chemical industry has suffered the fury of deflation as have the alcohol companies since the closing days of 1929 and throughout the entire of 1930. Inventories alike of raw materials and finished products became a nightmare. The price of blackstrap seemed destined to shrink to the vanishing point while the price of alcohol was more than halved in one week of ruinous competition. The financial reports of alcohol companies for 1930 and 1931 showed fully the net result of these unfortunate conditions.

All the more welcome then is the present favorable turn in the alcohol situation. Prices have advanced and remained at levels which should insure some profit, and while consumption of anti-freeze did not reach the proportions hoped for at the beginning of the season, the variable weather and cold March raised consumption totals higher than might be suspected. Finally and of greatest signifi-

cance, is the reduction in total inventories (duPont and Carbide excluded) from 21,000,000 gallons at the end of 1930 to 8,400,000 gallons at the close of 1931. Quality and service cannot be long maintained in the face of heavy deficits, so that consumers must feel relief at the present encouraging turn of alcohol.

News From the Nitrogen Front This season's fertilizer sales are done, and it would not be surprising if the coming summer saw a determined effort to arrange a new nitrogen truce. With the exception of the sulfate producers, whose supplies due to the industrial slack are smaller than usual, none of the forces in this three-cornered battle are in any position to carry on a crushing offensive. The Spring campaign has certainly not brought strength or comfort into any of the warring camps.

The virtual embargo against the Chilean natural material by France and Germany is at the expense of the agriculturalists of these two countries who must view with feelings that seriously temper their patriotism, the very much lower nitrogen fertilizer cost in the Low Countries, Scandinavia, and the British Isles. Had it not been that they enjoyed a similar protection for their finished products, vigorous protests would doubtless have been made long before this. Pretty obviously it is going to be the policy of the European countries to support their own agriculture with imports even at the expense of their industrial population, but it would appear that these water-tight compartment policies are apt to spring leaks before 1932 closes.

In Chile the producers are hard pressed by political and financial difficulties. In the midst of these Cosach has kept several plants in each of the three nitrate fields in production, certainly not in order to build up surplus stock, but as economic necessity inspired not a little by humanitarian motives. A complete shut down of the nitrate fields would cause great hardships among the population, and however expedient such a shut-down might be, it is obviously impractical in view of the tangled political situation. Criticism of the Cosach arrangement becomes louder and more definite, but in view of the marked superiority of the Guggenheim process and the extreme necessity of all of the producers, how can they but hang together?

Plenty of strong motives prompt some sort of an agreement, and the very marked decrease in nitrogen consumption this year on the farms of all countries provides a potent weapon for sustaining any cartel agreements during 1933.

Quotation Marks

The machine has a convincing story to present to the public, a story not based upon plausible theory, but upon forthright facts. A story that is an undeniable record of performance. The machine can look the public in the eye and say to it: "Here is my record, attested by Uncle Sam: In forty years of active and increasing use I have not deprived one American worker of employment; whenever I have closed one employment door I have opened another and a larger one.—*John H. Van Deventer, Editor, Iron Age.*

Senator Norris and his allies, for whom nothing will serve but outright Government ownership and operation, may not think it worth their while to read the memorandum accompanying the report, prepared by Lieut. Col. Tyler of the army engineers, on the "Cost to the Federal Government of Transmitting and Selling Muscle Shoals Power." Yet the figures are of a nature to make even believers in Government enterprise pause before they commit the Government to this venture.— *N. Y. Times.*

Magnesium is now passing through the same stages as did aluminum. In 16 years it has declined from $5.00 per pound to 30c.

Dr. Donald B. Keyes remarks that "Some people sincerely believe that our present financial and industrial depression was either directly or indirectly caused by our research activities."

Dr. Charles F. Kettering says, "I believe that if one-half of the energy was spent in getting products that people wanted to buy instead of stirring up the mud, we would get along a lot better."

Dr. Charles F. Burgess, in accepting this year's Perkin Medal award said: "There is a continuously changing economic background against which research must be judged.—*The Chemical Digest, Foster D. Snell, Inc.*

Fifteen Years Ago

(From our issues of May 1917)

New addition to Eimer & Amend plant N. Y. will cost $100,000.

Thousands of chemists file blanks with Bureau of Mines, stating preferences as to war services.

Marden, Orth & Hastings opens fifth branch office in America in Hoge Building, Seattle.

John F. Queeny returns from trip to Australia.

H. A. Metz & Co. increases capital stock from $50,000 to $250,000.

Charter of incorporation issued to National Aniline. Capital stock estimated at $17,231,000.

Semet-Solvay closes contract with the U. S. Government for approximately $400,000 worth of ammonium picrate.

Patchwork

Taxes

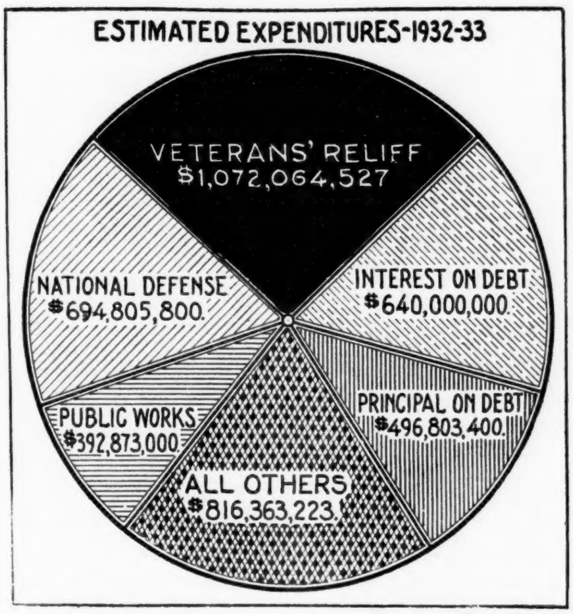
By John F. Queeny

Chairman, Monsanto Chemical Works

AMID all the uncertainties regarding the tax bill before Congress, as this is written, one plain, unpleasant fact remains. The Federal Tax Law of 1932 is sure to be a crazy quilt, designed of political sidestepping, selfish interest, sectionalism and expediency; all hurriedly thrown over the national deficit.

It is called an "emergency measure." There is no denying the emergency. A federal deficit of a billion and three quarters in the midst of grave, world-wide depression creates a critical situation. But an emergency tax system that makes the emergency more critical is destructive legislation raised to the Nth power.

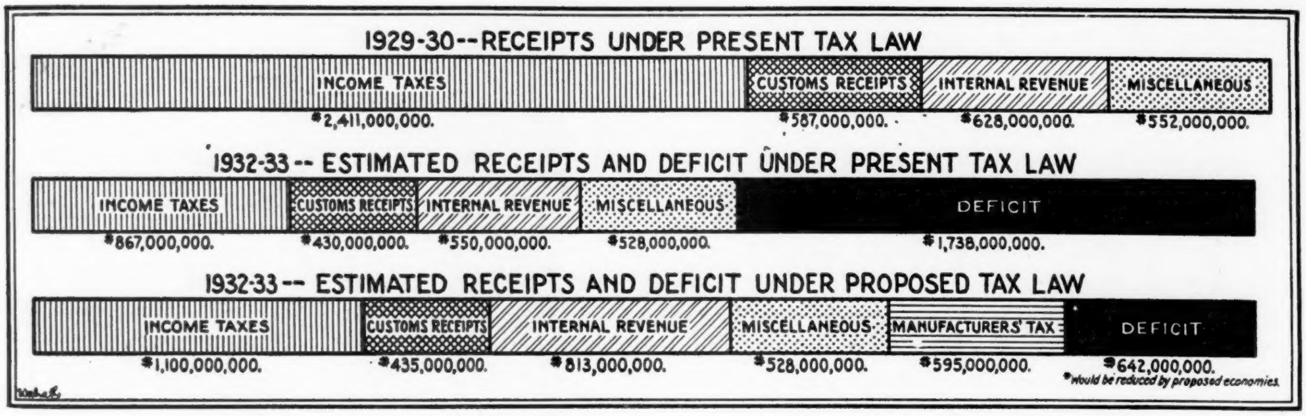
Human ingenuity could hardly devise a better means of digging the depression deeper. What we need is a better tax system: not a patchwork of worse taxes superimposed on our present bad ones.



Charts by "N. Y. Times"

Congress is missing a golden opportunity. Sound federal finance just at this time is the first requisite of recovery for our own people and its steadying, enheartening effects would be felt around the world. If the credit of the United States of America becomes shaky, the very foundations of our monetary system tremble. Nor is this a temporary crisis to be met by temporary measures. We are struggling through a readjustment that touches every product mankind uses and effects every human being on the globe. It may take us a long time to complete all the necessary, complicated changes. The after effects are still unguessed, but they will certainly be serious. For every single American, man, woman, or child, executive or laborer, farmer, banker, or priest, rich and poor alike, for us all a just system of taxation that will not only furnish necessary government revenue, but also place the very lightest possible burden upon us as individuals, and what is even more important a system that will restore credit confidence and encourage capital expenditures in industry and agriculture, and trade.

The faults of our present system of taxes on the incomes of individuals and the profits of business have been laid bare. It is woefully lacking in revenue producing at the time funds are most needed. It is full of inequalities, of inconveniences, and of injustices. Because it is so complicated it is a costly tax to check and administer. Its provisions to exempt "earned income" are a farce. It leaves big gaps for tax dodgers at both ends of the income scale. The millions of dollars that have been collected in back taxes



and repaid in refunds shows plainly how uncertain and complex the present system is. The tax on capital gains is admittedly "bad business" and promotes unsound financial policies. So complicated has the filing of a return become that it is costing the taxpayers millions of dollars a year in fees to tax experts and accountants. A thorough-going study of this unsatisfactory and unsound tax system is certainly in order. As never before the people recognize this. Right at this moment any serious, non-partisan effort to give us a scientific, simplified, sound tax system would not be hailed. If the Democrats—yes, and even the Republicans—had the foresight to have sensed this and the courage to stand behind a scrupulous revision of our federal taxes designed not only to raise the needed revenue, but also to assist the recovery of industry and the rehabilitation of agriculture, then the political history of the next few years would have quite a different complexion. And what a difference such a tax system would have made to all of us!

What May We Expect of Congress?

Instead of helping, Congress is apparently doing its best to hurt our economic position by magnifying the follies and injustices of the present tax law. They have jumbled still further the complications and uncertainties of the income tax system. They have redoubled their attacks upon capital just at the time when capital needs every encouragement to start again the wheels of commerce. They have voted down the sales tax and then, as Will Rogers gleefully points out, proceeded to tax chewing gum and matches. They have tried to write tariff duties into a domestic tax law. They have proposed retroactive taxes most astonishingly similar to those that roused our holy horror when they were proposed by Mexico. With a great ballyhoo for the common citizen of modest means they have presented the most discriminatory and undemocratic tax measure of our times, and one that will avowedly fail to raise the revenue the Government must have.

Carried to its logical conclusion the very sales tax which Congress turned down in the midst of howls and catcalls, is the solution of our tax problems. The trouble was that the measure proposed by the Ways and Means Committee did not go nearly far enough. Because it attempted to pick out certain sales for tax and to exempt others, it became, not a real sales tax, but a discriminatory excise.

The turnover tax, on the other hand is a tiny tax—two-tenths of one per cent, or two dollars on a thousand dollars worth of sales—that will raise as large a revenue as the income taxes raised last year. This is the tidy sum of two and a half billion dollars. Provided, that is, and here is the catch for the dyed-in-the-wool politician, provided this is a real turnover tax, a tax on every single sale in the country, be it of goods, of real estate, of securities, and of services, which means fees, royalties, wages, and salaries.

How such a tax might be simply and economically collected through the Post Office was set forth ably by Dr. Grosvenor in the March issue of CHEMICAL MARKETS and he knocked down one by one the arguments against this turnover tax.

But I would like to advance a few of its very great advantages, not with the wildest hope that so sound and simple a tax will be forthcoming out of the present Congress—but why shouldn't it—but because I believe that eventually we shall have to come to the sales tax anyway. Whatever we can do now to advance the cause will some day help—well, let us hope it will help our grandchildren, for it takes about two generations for an idea so truly democratic, so simple, inexpensive, and economically sound to sink in. I have advocated this form of taxation before and I am advocating it again now.

What is a Fair Tax?

Broadening the tax base is the sole way to raise large sums of money without raising certain tax rates to the point of strangulation. Moreover, if every person gainfully employed had to pay a direct tax, however small, out of his own pocket, we would do more to rouse the voters of this republic to a sense of responsibility than ten thousand times ten thousand of speeches and editorials. That is the truly democratic tax, and it is the safe tax, for it is those who pay the taxes who do pay attention to government for selfish reasons, and it is a dangerous thing for the

poor man to live under a government which is ostensibly supported by the rich citizens and the big corporations. A Congressman should be keen enough to take care of a goose that lays golden eggs. So a direct tax—so small it will not be a burden—paid by all the people is not only the democratic tax, but it is the safe tax.

Such a tax on expenditures is also preeminently fair. It is true enough that a man with an income of twelve hundred dollars will spend a greater proportion of his money on shelter, clothes, and food; but his expenditures will in the gross not be proportionally greater than those of a man with one hundred and twenty thousand dollars. The rich man's purchases of real estate, or yachts, or stocks will be taxed, and there are but two things he can do to avoid paying, give his money away or put it in a savings bank. There is no reason why with the turnover tax we should not have taxes on gifts and taxes on truly unearned income, namely income from rents, dividends, interest received. Nor is there any reason why such income taxes might not be exempted for all receipts say up to a thousand dollars. This would cover the interest on the sweat o' the brow savings of any man however industrious or thrifty. Furthermore, there is no serious objection to scaling up such income taxes beginning at one per cent on a thousand dollars and advancing to twenty-five per cent on say two hundred and fifty thousand dollars on truly unearned incomes. Above twenty-five per cent tax has been proved, so I understand, to be a boomerang in that all of us need these surpluses of working capital for investment.

Another advantage of the turnover tax which will appeal to the business man is that it is a tax, which actually promotes business efficiency. Far from criticising the advantage given by the turnover tax to the large intricated company carrying on vertical operations, a broad minded citizen should welcome a tax which promotes efficiency in our distribution system that now takes pretty close to fifty cents out of each dollar the ultimate consumer spends for what he needs. A tax that puts a premium upon lowering costs both of manufacture and of sale, instead of the present tax which places a penalty upon profits, has in its very principles much to commend it to those who believe that we are all of us helped by any efficiencies and economies which American business as a whole is able to effect.

Norsk Hydro A-S has decided to discontinue manufacture of calcium nitrate at Herya plant. Instead, nitrate of soda is to be made, which at the beginning was merely a by-product. Activities of Norsk Hydro A-S have had to be curtailed recently and a total of 600 workers have been released, although 3,000 or more still remain at work at the various plants.

I. C. I. Explosives, Ltd., has been registered in London, with capital of £1,992,900 in £ shares. Concern, which is a subsidiary of I. C. I., was formed with the object of holding not less than ninety per cent of the companies controlled by Imperial Chemical engaged in the manufacture of explosives.

International Consumption of Rayon

Rayon is one industry that went to new high world production figures in 1931. Consumption figures were also higher, but failed to keep pace with the growth in production. In this country yarn consumption grew at a faster pace than production. Prices were disappointing and leading factors were discouraged by the final financial returns for the year. Edward T. Pickard, Chief, Textile Division, Dept. of Commerce summarizes the Rayon industry in an article appearing in "Commerce Reports."

"World production of rayon yarn in 1931 is estimated by the trade to have reached 467,505,000 pounds, a 12.7 per cent increase over the output of 1930 and 7.4 per cent above the previous record of 1929. American production, estimated at 144,350,000 pounds, was 31 per cent greater than in the preceding year and 18.7 per cent over the 1929 peak. Other leading producers showing impressive gains were Italy, Great Britain, Japan, and the Netherlands, Germany and France are reported by the trade to have experienced smaller outputs."

"Viscose rayon comprised over 94 per cent of the world output, according to trade estimates, and about 86 per cent in the U. S. acetate yarn ranked second. Trade estimates of world production of rayon by processes and total consumption by countries follow":

Estimated World Production and Consumption of Rayon, 1931

Country	Production: Viscose Thousand pounds	Acetate Thousand pounds	Cupra Thousand pounds	Nitro Thousand pounds	Total Thousand pounds	Consumption Total Thousand pounds
Belgium	9,300	850	....	....	10,150	5,148
United Kingdom	43,935	9,830	400	....	54,165	48,200
Canada	4,400	1,200	....	....	5,600	6,000
Czechoslovakia	4,620	....	....	....	4,620	14,300
France	32,120	5,550	650	....	38,320	18,460
Germany	42,300	3,200	6,500	....	52,000	62,500
Netherlands	20,250	....	....	....	20,250	2,350
Italy	70,300	2,200	1,500	....	74,000	23,000
Japan	47,000	....	450	....	47,450	43,000
Poland	4,850	....	....	....	4,850	4,500
Switzerland	8,850	150	....	....	9,000	3,200
United States	124,025	10,825	2,500	7,000	144,350	154,350
Other countries	2,750	....	....	....	2,750	55,600
Total	414,700	33,805	12,000	7,000	467,505	440,608

Imports of Rayon Yarns into the United States

Country of origin	1929 Pounds	1929 Dollars	1930 Pounds	1930 Dollars	1931 Pounds	1931 Dollars
Austria	145,328	100,729	19,686	11,513	......	......
Belgium	323,853	215,320	36,165	22,355	330	463
Canada	31,962	23,304	8,920	11,072	4,720	3,568
France	3,474,061	2,295,376	812,837	638,958	107,074	106,262
Germany	5,246,834	4,603,744	1,826,133	1,610,205	851,937	612,931
Hungary	42,569	59,480	......	......	......	......
Italy	3,330,473	2,212,861	1,650,906	1,214,942	157,915	100,363
Netherlands	2,408,931	1,748,209	1,111,173	785,710	342,472	175,091
Switzerland	658,287	521,653	201,508	188,566	226,185	239,197
United Kingdom	250,260	342,297	141,618	189,533	192,117	238,269
Other countries	37,898	23,953	3,819	3,030	......	......
Total	15,950,456	12,146,926	5,812,765	4,675,884	1,882,750	1,476,144

Reichstag Commission of Inquiry has just concluded its investigation of the German soap and cosmetics industry.

All larger German soap manufacturers belong to a national association called "Wirtschaftsbund der Deutschen Seifenindustrie."

In analyzing the cost of production in the soap industry, the report emphasizes the high expenditures for sales promotion and advertising which amount to between 15% and 38.5% of total expenditures. The cost of production proper consists of raw materials, 45.9% to 71.7% and the cost of manufacture, 9.3% to 25.8%.

The retail dealers mark-up represents 20% to 33⅓% of retail prices in the case of household soaps and detergents.

German exports of soaps have expanded to a remarkable extent since 1913. The value of such exports increased from 9,920,000 marks in 1913 to 17,360,000 marks in 1925 and 25,980,000 in 1930.

Are Labor Saving Devices Sound, Just and Profitable?

By George Paul Torrence

President, Link-Belt Company

OUR distribution, our credits, our manufacture, and business generally, are all very much out of gear. The seriousness of the situation scarcely can be over-emphasized and in these days of widespread unemployment, and the distress which follows, a sincere doubt has come into the minds of many executives regarding the social wisdom of material handling machinery and all devices that make for an increase in production in relation to the number of people employed.

Magazines and books on economics and social problems have much to say about technological unemployment. Some have the opinion that production machinery has been developed and used to too great an extent, and that we would all be better off if we did not have as many devices for quantity production and for the saving of labor.

As conscientious citizens, as well as manufacturers and users of material handling devices, we want to analyze these trends of thought, to be sure that we are on sound ground ethically, as well as practically, in manufacturing and using labor saving machinery.

Material handling devices form merely one group of labor saving devices. Machine tools form another group that has had a large influence in making quantity production possible. Agricultural implements are another. Almost every modern mechanical tool and electrical device has contributed its part to quantity production. Thus either all are wrong or all are ethically wise.

The phrase "Labor Saving" is applied more frequently to material handling devices than to machine tools or agricultural implements, because common labor is replaced while the machine tool frequently replaces skilled workmen. Perhaps it is easier for the laborer to find a new opportunity than for the skilled workman. The result is the same in all cases.

Statements have been made many times during the last few years showing that the people of the United States have more material things to make them happy and to make their lives worth while, and also have more educational advantages than any other nation previously has achieved. This has been true with the shorter working hours making possible the enjoyment of these advantages. We have thought of ourselves as a nation of prosperous citizens. Something has happened to stop our prosperity. For the moment our situation is out of gear, but this does not change the fundamental reasons making possible the widespread distribution of material things and educational and social advantages.

One hundred years ago considerably more than half the people of the United States were farmers. It took more than half our population to feed themselves and to feed those engaged in other enterprises. Today about twenty per cent of our population is on the farm. With the machinery now used, that twenty per cent produces the food required for themselves and for the other eighty per cent, and has enough surplus to demoralize prices completely. If we were to take from the farmer the mechanical equipment he now has, we would go back to a situation where more than one-half of our people would be required to produce the food by which we all live, and we would not have people for the manufacture of automobiles, radios and the other things that comprise the advantages that we have enjoyed. These commodities could not then be available to the people generally.

Simple arithmetic gives the answer. What we each have depends on the total made by all. The more things the one hundred and twenty million people of the United States can make, the more will be available

to be divided among the one hundred and twenty million.

Thus the general distribution of material things, and the amount of leisure for the enjoyment of these things and educational and cultural advantages, are wholly and completely dependent upon production and machinery that enable one individual to make more units in less time, so that these many things are available for distribution to other individuals.

Our problem socially and economically today is not to reduce the number of mechanical devices, not to abandon the use of labor saving equipment; but to get our financial structure working so that the general distribution of the products from quantity production machinery will be re-established.

The next question is, how can material handling devices be used to help the re-establishment of business relations generally, on a basis that is sound and enduring? The present entirely chaotic situation may correct itself in a number of ways. One way is for the disintegration of our general business and social structure to continue. Individuals and families will drift back to the land, so that they can produce from the land their needs, and thus continue to exist without much money and without dependence on others. If this should happen, it would mean that we would set back our civilization and our development more than one hundred years.

Reorganization for Profit

Another phase of the same kind of disintegration is the continued expenditure on the part of our governmental bodies of large sums out of all proportion to the income of the people and of business, with a consequent demoralization of the credit structure of our country. If this continues long enough our dollar becomes worthless and we all must start over again with nothing except our material possessions. Neither government nor individuals can continue to spend beyond what is being made, without disaster.

Another way is for business and industry to take the position in their thinking and in their practice that the present hazardous situation will not correct itself by its own momentum, and that the way out is to reorganize on the basis of present volume, so that each business becomes a profitable enterprise, instead of a losing and dangerous venture. If it were possible today for industry and business to make a profit, so that fair wages could be paid and dividends distributed to the owners, our present industrial depression would be very shortly at an end. If steps to that end are not taken, the depths reached before the turn, may be very great.

The business that deliberately conducts itself without a profit is as definitely a slacker as the individual was during the war who worked for the downfall of the country then.

If it were possible today for industry and business to make a profit, so that fair wages could be paid and dividends distributed to the owners, our present industrial depression would very shortly end.

A Sales Tax Remunerative to Business

It is undoubtedly true that many business enterprises have been working on the philosophy that our present situation is temporary, and is bound to turn without any constructive action on their part. Such businesses have thought that their own salvation lay in continuing through this depression by getting a volume out of proportion to business generally. This volume has been secured usually by an entire disregard of actual costs of manufacture. The result of this philosophy has been a disintegration of prices of many commodities and raw materials, with large losses to the manufacturers and producers. This has not been universally true, but it has been quite generally true, and it is true that business generally is being done at a loss. Obviously this cannot be continued indefinitely, or the disintegration mentioned before will become an actual fact. There is a limit to losses. It is dangerous to wait for the turn.

A profit or loss on a business enterprise is the difference between the number of dollars secured for the product, and the number of dollars expended in the manufacture of the product. To make the balance favorable, two remedies can be applied. One is to increase selling prices, and the other to reduce costs.

The House of Representatives debated the question of a general sales tax. The decision was against a sales tax, but most newspapers and current magazines have indicated that the people generally consider this decision on the part of the House of Representatives unwise, and that a general sales tax was a constructive way out for the government. A general sales tax of two and a fraction per cent would, of necessity, have increased the selling price to the consumer by at least that amount, unless losses were to be increased, which is unthinkable. If such an increase in prices is wise from the standpoint of integrity of the government, it is also wise from the standpoint of the integrity of business and industry, on which the government rests. An advance in prices of 5 or 10 per cent on com-

modities now sold at a loss, would change business from a losing enterprise to a profit showing enterprise, and thus in place of continuing disintegration, we would have a foundation on which we could re-establish business stability. With stability achieved, the volume of business would grow as it has from every low point. Such an advance in prices might be called a "Prosperity Boost."

Profit showing is essential to the continued stability and integrity of business and of the individual, and therefore for the country generally. There should come a general feeling among all the people that the business that deliberately conducts itself without a profit is as definitely a slacker as the individual was during the war who worked for the downfall of the country then.

Reduction of cost is nearly always possible. It is in the reduction of cost that labor saving equipment can do its part. Profit is essential to the continued integrity of the country. Thus every step taken to accomplish profit is wise. The use of material handling equipment properly applied is a large element in the reduction of the cost of manufacture. It is right and proper that the manufacturers of such equipment emphasize this, and the economies that can be accomplished. The equipment should be called correctly Labor Aid Machinery, not Labor Saving Machinery.

Coal by-product output of the Saar region during 1931 was as follows: Coal tar, 109,621 tons; ammonium sulfate, 22,356 metric tons, and benzol, 29,211 tons.

The 1930 figures were approximately as follows: Coal tar, 136,000 tons; ammonium sulfate, 29,600 tons, and benzol, 35,600 tons.

South Manchurian Railway Co. is to launch various important enterprises in Manchuria and Mongolia as soon as political conditions in the new State warrant. First project planned, according to report , is the establishment of a huge sulfate of ammonia factory in Dairen. Nitrogen will be extracted from the air. The enterprise will involve a cost of about 20,000,000 yen ($7,200,000 average exchange for January).

In view of the present ammonium sulfate "anti-dumping" investigation now under way at Washington the rise in volume of sulfate exports to the U. S. is of special significance. No shipments were recorded prior to 1930 but in that year were made to a total of 4,257 metric tons. This business was increased last year to a total of 62,151 tons, making the U. S. the second best customer and exceeded only by Spain.

Methyl alcohol, ordinarily enters Japan at the rate of about 3,000 tons a year, valued currently at yen 1,200,000. The industrial laboratory of the Ministry of Commerce and Industry has succeeded in making it commercially and has taken out a patent on its process. This right is to be transferred to an association of five concerns, embracing Mitsui Mining, Japan Oil, Japan Acetic Acid, Edogawa Industry and Seizaburo Kajima.

Are Canadian sulfur imports from the U. S. in jeopardy? W. G. Hubler, Canadian metallurgist, told the members of the Canadian Institute of Mining and Metallurgy at its recent meeting that Canada can provide cheaply all its own sulfur requirements. He stated that with the Freeman-flash roasting process for the treating of sulfur-bearing ore that sufficient tonnage can be obtained to eliminate the necessity of importing $7,000,000 worth of sulfur from the Texas fields.

The Industry's Bookshelf

Pathways Back To Prosperity, by Charles W. Baker, 370 p., published by Funk & Wagnalls, N. Y. $2.50.

No one will question the author's claim that he views the problem of technological unemployment with the sympathetic viewpoint of an engineer—he was for 22 years editor of the "Engineering News." He sums up the problem, "We must squarely face the fact that the invention of labor-saving machinery and all that has gone with it—efficient organization and the development of transportation—has so enormously increased the productive capacity of the world's industry and reduced the amount of labor necessary to carry it on that new economic conditions have been created such as the world has never before experienced in all the course of history."

Profitable Practice In Industrial Research, by Malcolm Ross and others, 281 p., published by Harper, N. Y. $4.00.

Much ballyhoo has been expended on the subject of research, it has become a fetish with directors, financiers and stockholders. While plenty of energy has been showered on the erection and equipment of large laboratories it is becoming increasingly doubtful if all of this money is being spent wisely. More thought in many instances is imperative on whether or not the objects of such research are profitable and less concerning the physical size and equipment of the facilities. In this book 14 of the nation's recognized leaders of research attack the problem from different angles of turning research into profitable channels and assuring the proper monetary reward for the capital invested. The list of contributers include such well-known chemical leaders as Mees of Eastman Kodak, Stine of duPont, Burgess, director of the Bureau of Standards, Little, Arthur D. Little, Inc., Weidlein, Mellon Institute. The book was prepared under the auspices of the Division of Engineering and Industrial Research, National Research Council.

The New England Cotton Textile Industry, by J. Herbert Burgy, 246 p., published by The Williams & Wilkins Co., Baltimore, Md. $4.50.

The decline of the New England section as a cotton goods manufacturing center in favor of the southeast is perhaps the outstanding example of the tide of geographical change in American industry. The author by a thorough survey of all of the factors concerned shows that economic factors today surpass that of geographic location.

Jobs, Machines, and Capitalism, by Arthur Dahlberg, 270 p., published by MacMillan, N. Y. $3.00.

Technological unemployment is one of the most lively discussed questions of the day. There are those who admit that the machine throws out of work larger numbers than are returned to industry because of new industries, greater demand, etc. On the other hand many do not subscribe to these statements as being actually the facts. Believing that we are confronted with a real problem, Dr. Dahlberg has after eight years of thought concluded that the best solution if not the only one lies in the shortening of the hours of work. One of the best of the host of books that are at hand dealing with technological unemployment. The author takes us to the year 2029 and shows how with the knowledge gleaned in the past 100 years the problem of depression is met successfully. Are we, or our childrens' children headed for a universal four hour day?

British Plastics Year Book 1932, published by Plastics Press, Ltd., 19 Ludgate Hill, London, E. C. 4, England.

Distinctly more than a mere directory of supplies and equipment which would be of very limited value in this country. The book contains a very complete and authentic survey of moulding materials, new developments in manufacturing technique, etc. In addition, one section is devoted to a valuable list of data that is of special significance to the plastics trade.

Metallic Cousins with a Chemical Future

By S. Skowronski and M. A. Mosher

IT CAN readily be seen from the accompanying table that selenium can no longer be classed as a rare or even semi-rare metal, and that it has finally reached a place of commercial importance. The consumption however is still considerably below the amount which the refineries can produce.

M. A. Mosher

The chief use for selenium is in the glass industry, where it is employed both as a decolorizer and in the manufacture of ruby glass. During the World War, the embargo on the use of high-grade manganese dioxide for the decolorizing of glass led the glass manufacturers to substitute selenium, and the large amount of selenium used for this purpose accounts for the rapid increase in the sales of that metal. The ceramic industry uses selenium in conjunction with cadmium sulfide to obtain various red and orange shades of enamel.

Of late years selenium has been used with success in rubber compounding, since it increases the resistance of the rubber to abrasion by 50 to 80 per cent. Wire cable sheathed with selenium rubber is on the market and is advertised as such. Other uses for selenium rubber, such as in tires and mechanical rubber goods, are still in the experimental stage. Selenium will act as a flame-proofing material in cable, not only when applied to the surface, but also when compounded with rubber to the extent of 8 per cent. Some selenium is now used in the dye industry for the manufacture of special dyes.

CONSUMPTION OF SELENIUM IN THE UNITED STATES

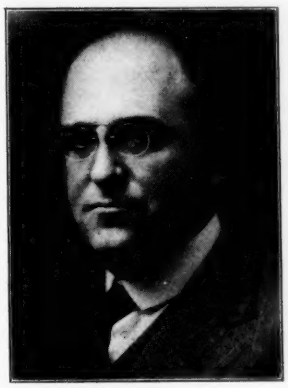
Year	Total Sales Lb.	Total Value	Unit Value Per lb.
1921	55,978	$89,148	$1.59
1922	123,565	177,542	1.44
1923	127,174	237,196	1.86
1924	153,762	286,066	1.86
1925	194,007	330,637	1.70
1926	252,312	438,132	1.74
1927	284,508	491,996	1.73
1928	362,697	607,382	1.67
1929	344,288	568,265	1.65
1930	278,369	454,911	1.63

CONSUMPTION OF TELLURIUM: UNITED STATES

Year	Total Sales Lb.	Total Value	Average Value Per lb.
1926	1,106	$2,229	$2.02
1927	1,003	1,913	1.91
1928	1,060	1,960	1.85
1929	1,309	2,710	2.07
1930	4,717	7,996	1.70

With the development of television, selenium cells have been improved considerably, and the lack of uniformity and high inertia of the earlier types of cells have been corrected. Several makes of selenium cells are on the market today that are guaranteed to give satisfactory service. For the glass, ceramic, rubber, and dye industry, selenium pulverized to pass a 100 mesh screen and analyzing not less than 99 per cent of selenium is usually specified. For cell purposes the vitreous selenium, cast either in stick or cake form, is recommended.

G. D. Bengough and L. Whitby report that a process has been developed for the production of a film of selenium on several light magnesium alloys. This film imparts considerable resistance to the corrosive action of sea-water spray. The film is normally produced by immersion for a few minutes in a bath containing selenious acid, but may also be obtained by rubbing the alloy with a spongy material dipped in the bath. The film has the property of self-healing to a limited degree especially



S. Skowronski

when immersed in stagnant sea water. This process may prove to be of considerable importance for the protection of magnesium-rich alloys, particularly those used in air craft construction.

The commercial use of tellurium remains disappointingly small, as the statistics on the consumption of the past five years shown on the previous page will prove.

The chief cause of the increased consumption in 1930 has been large scale experimentation with tellurium as a rubber compounding material.

Di-ethyl telluride was one of the first anti-knock compounds to be discovered and added to gasoline. It proved to be effective and efficient, but the probable demand was so much greater than the visible supply that the use of tellurium for this purpose was abandoned.

During 1922 more than 1,000 lb. (454 kg.) of metallic tellurium was sold to radio manufacturers for the manufacture of crystal detectors, but the rapid advance in the technology of radio vacuum tubes quickly stopped the use of tellurium for this purpose. Electroplaters are using a solution of tellurium chloride as a dip for silverware when a dark finish is wanted.

Due to the similarity in the physical appearance of tellurium to antimony and bismuth, many experiments have been made to alloy tellurium with other metals, but because of the ease with which tellurium forms tellurides with most of the metals, the experiments have all been unsuccessful.

Tellurium is usually sold in one, five, or ten-pound cakes analyzing 98 to 99 per cent Te, the chief impurity being selenium. Tellurium is also furnished in powdered form when desired. Two grades of tellurium oxide are on the market, one chemically pure and the other containing small percentages of selenium and sodium salts.

Copper selenide and copper telluride are not soluble in the solid solution of copper, and crystallize between the crystal boundaries. They therefore have little effect on the electrical conductivity of copper, differing, markedly in this respect from arsenic and antimony.

To electrochemists the fact that tellurium, a metalloid, can be readily electroplated out of a fluoride electrolyte should be of interest. Professor Frank C. Mathers in 1928 exhibited some remarkable specimens of electrolytic tellurium. The deposits, plated on lead starting sheets, were about a half inch thick and unusually smooth. Professor Mathers tried various electrolytes but the one he especially recommended had the following composition:

Anode, tellurium; cathode, lead; current density (anode and cathode), 1.6 amp./sq.dm. (15 amp./sq.ft.); bath voltage about 1 volt; temperature, room. HF vapors are evolved from this bath during electrolysis.

	G./L.	*Oz./Gal.*
Tellurium dioxide (83 per cent)	300	40
Hydrofluoric acid (48 per cent)	500	67
Sulfuric acid (96 per cent)	200	27

Sulfuric acid was not essential although it seemed to improve the deposit.

Fair success was also had using an electrolyte made by dissolving tellurium dioxide in a mixture of hydrochloric acid and sulfuric acid. Crude tellurium was used for the anode and Professor Mathers found that the selenium present in the anode did not deposit on the cathode but remained in suspension in the electrolyte in the red elemental condition; he therefore suggested the electrolytic refining of tellurium as a method of separation from selenium.

Good results may also be had using an electrolyte made by dissolving tellurium dioxide in a mixture of sulfuric and tartaric acids, but the solubility of tellurium dioxide in this mixture is small and new tellurium dioxide must be constantly added. Carbon or graphite may be used instead of lead as the starting cathode from which the tellurium deposit may be easily stripped. Copper can not be used due to the rapidity with which copper telluride forms on the surface of the cathode, but if a tellurium deposit on copper is desired a preliminary lead deposit can be flashed on the copper.

Bright deposits of electrolytic tellurium have been obtained and do not tarnish readily, but the brittleness of the deposit makes the use of tellurium as an electroplating material of doubtful value.

A vast amount of research work on selenium and tellurium has been done and reported in the literature. In 1926 Marian Foster Doty of the New York Public Library staff compiled a comprehensive bibliography on the subject of selenium covering references to the literature extending from 1817 to 1925. This valuable collection of references covers 114 pages, and copies are obtainable from the Library at a nominal price.

In July, 1930, the United States Bureau of Mines issued Information Circular No. 6317, a 23-page booklet giving the properties, uses, tests, occurrence, preparation, markets and prices of selenium and tellurium.

The analytical chemistry of selenium and tellurium including the various analytical methods used by the refineries, has been thoroughly covered by Dr. Victor Lenher in a paper entitled "Occurrence, Chemistry and Uses of Selenium and Tellurium," Transactions American Institute of Mining and Metallurgical Engineers, Volume 69, page 1035 (1923).

U. S. Bureau of Mines helium plant near Amarillo, Texas, has now been so enlarged and improved that it has a possible production of 36,000,000 cubic feet of this gas annually, according to Dr. C. W. Seibel, supervising engineer.

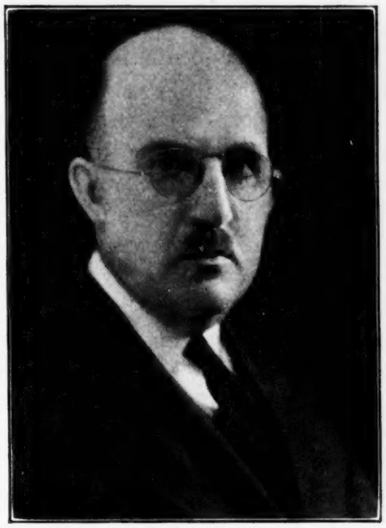
With the completion of the new dirigible Macon, the government's possible yearly helium requirement will be approximately 20,000,000 cubic feet. This will leave an excess annual productive capacity of 16,000,000 cubic feet to meet emergencies.

Plant consists of two units, each capable of producing 18,000,000 cubic feet a year. The cost of production has been reduced to approximately $5 per 1,000 cubic feet. The purity of the gas is now 98% to 99%, compared with 94% to 95% before efficiency methods of production were adopted.

Chemical Possibilities of Hydrocyanic Acid

By Guy H. Buchanan

Chief Technologist, American Cyanamid Co.



HYDROCYANIC acid is an exceedingly interesting chemical raw material and its availability in commercial quantities should not be overlooked. It has usually been too carefully avoided because of its poisonous properties. Admitting that it must be handled with great caution, it is nevertheless not more dangerous than many other chemical compounds which chemists are called upon to produce and use. In an experience covering ten years of manufacture and use, during which time many millions of pounds of the liquid have been handled, we have had only one fatality in our organization, and this resulted from neglect of a well established rule, that against attempting to remove a valve from a cylinder without taking proper precautions to cool the liquid in the cylinder below its boiling point. A number of chemical compounds usually considered much less formidable than hydrocyanic acid do not have so good a record.

Of first importance in the use of the liquid is experience in handling it, and we have made it a practice to offer the services of our laboratory to those desiring to experiment with the liquid but lacking the necessary experience. A man thoroughly familiar with the liquid is assigned to work with the prospective customer in carrying out his experiments.

Since the present discussion relates primarily to the chemical aspects of liquid hydrocyanic acid, we will pass rather briefly over its use in fumigation in spite of the fact that this industry is the largest user of the liquid.

In citrus fumigation a canvas tent is placed over the trees in order to retain the gas and the liquid hydrocyanic acid is atomized under the tent, where it evaporates almost immediately. Since the tree, as well as the scale insect, which is the pest to be controlled, is a living organism, the dosage of liquid must be exactly controlled, otherwise injury to the tree may occur. Since the tree is least sensitive to hydrocyanic acid at night, the fumigations are almost always carried on after dark. Dosage is based upon the size of the tree, and the required amount of hydrocyanic acid has been worked out by the State Experiment Station. An average dosage per tree would be in the neighborhood of 8 to 10 units equivalent sodium cyanide, which corresponds to around 150-200 cubic centimeters of liquid per tree. Pumps have been developed to a high degree of accuracy. State inspectors regularly patrol the fumigated areas and calibrate the pumps which must be accurate within at least 2%.

In industrial fumigation the liquid may be employed in a variety of ways. Flour and similar large mills now have permanent piping installed with atomizing nozzles distributed throughout the building. Cylinders of liquid hydrocyanic acid are attached outside the building and the liquid forced through the piping and spray heads by air pressure. Where fumigation is less frequently practiced, or where it is undesirable to install permanent piping, the sprays are attached to lines of pressure hose distributed throughout the building.

Just as the invention of dynamite solved many problems of nitroglycerine utilization, so have many of the problems of fumigation been solved by absorption of hydrocyanic acid in a porous absorbent. One advantage of this method of packing is that light metal cans may be used with safety. If, by accident, a hole is punched into one of these cans, there is only a gradual escape of gas. The tare is of course enormously reduced over that of a steel cylinder and transportation of small lots is greatly simplified.

The original absorbent consisted of broken fragments of calcined cellite brick. This product was

developed in Germany under the trade name "Zyklon." The Discoid, a development of our own has a greater absorptive capacity for hydrocyanic acid than the cellite, permitting the use of a smaller can for the transportation of a given amount of liquid. The Discoids are also easier to clean up when fumigation is completed.

Vacuum fumigation is employed for cotton and other tightly packed commodities. The materials to be fumigated are placed in large vacuum containers and the air removed with a vacuum pump. Liquid hydrocyanic acid is then admitted into the vacuum chamber after which air is usually admitted to force the fumigant into the pores of the articles under treatment. After a period sufficient to insure complete destruction of the pests, the vacuum is again applied to remove the fumigant, followed by one or more scrubbings with air to free the fumigated material from traces of absorbed hydrocyanic acid.

Of the chemical reactions of hydrocyanic acid those involving the formation of aldehydes and the reaction with aldehydes are among the most important. Hydrocyanic acid is used in the Gatterman synthesis for the production of aldehydes, and certain aldehydes not readily obtainable in any other way can be produced by this synthesis. It involves the use of hydrocyanic acid with hydrochloric acid in presence of a condensing agent such as aluminum chloride or zinc chloride. Thus when toluene is reacted with hydrocyanic acid and hydrochloric acid in presence of aluminum chloride, an imido aldehyde is formed, which on further treatment with hydrochloric acid yields para tolyl aldehyde. This reaction does not take place with either benzol or chlorbenzol.

Reaction also occurs with phenols to produce oxyaldehydes. Good yields of the corresponding oxynaphthoic aldehydes are secured from alpha and from beta naphthol. From guaiacol, vanillin is obtained. Ethers such as anisol yield alkoxybenzaldehydes.

Chemical Uses of Hydrocyanic Acid

Of greater commercial interest at the present time is the reaction of hydrocyanic acid with aldehydes and ketones to form the nitriles of hydroxyacids, a method which is readily available for the production of these acids and their esters.

For example, when equimolecular quantities of hydrocyanic acid and acetaldehyde are mixed and a small amount of alkali is added to act as catalyst, a reaction occurs which may be violent unless carefully controlled. The product is the nitrile of lactic acid. In carrying out this reaction on a commercial scale the hydrocyanic acid is charged into a brine cooled kettle and a very small amount of aqueous caustic soda solution is added. The acetaldehyde is now added slowly so that the temperature in the kettle does not rise above the boiling point of hydrocyanic acid. By carefully proportioning the amounts of the reactants a product may be obtained analyzing between 97 and 98% real lactonitrile. When the lactonitrile concentration has reached this figure, as determined by analysis, the alkali is exactly neutralized with acid and the resultant nitrile is ready for further use.

The reaction of aldehydes and ketones with hydrocyanic acid reaches an equilibrium which depends upon the temperature at which the mixture is maintained and the aldehyde or ketone used. In the case of the acetaldehyde reaction it goes almost to completion at ordinary room temperatures.

The nitrile of lactic acid produced as above may now be converted into lactic acid by treatment with aqueous hydrochloric acid, lactic acid and ammonium chloride being produced. The process has thus far not found extended application for the production of lactic acid for the reason that it is difficult to separate the acid from the last traces of ammonium chloride. A very concentrated acid of good color can, however, be secured which is free from many of the impurities found in lactic acid produced by fermentation.

Instead of aqueous hydrochloric acid we may employ alcoholic hydrochloric acid, in which case we form ethyl lactate and ammonium chloride, a mixture readily separated by distillation. We employ this method commercially for the production of ethyl lactate, which is used as a high boiling nitrocellulose and cellulose acetate solvent.

Reaction in the Vapor Phase

This reaction between aldehyde and hydrocyanic acid also occurs in the vapor phase. We have found it possible to neutralize dilute mixtures of hydrocyanic acid in air, for example the atmosphere of a fumigated room, by vaporizing into the room acetaldehyde in amount sufficient to react with the hydrocyanic acid plus a little ammonia to act as catalyst. It is thus possible to enter a fumigated space without actually ventilating it. This process, although technically interesting, is not employed in actual fumigation practice.

When acetone is reacted with hydrocyanic acid in the presence of a small amount of alkali, we obtain the nitrile of alpha hydroxy isobutyric acid, also known as acetonic or butyl lactic acid. In this case the reaction is not as complete as in the case of acetaldehyde. At 25° C. acetone cyanhydrin is 14% dissociated, while at 0° C. it is only 6% dissociated. The reactants are mixed in the usual way, maintaining the temperature just below the boiling point of hydrocyanic acid. When all of the acetone has been introduced, the mixture is slowly cooled to the lowest temperature obtainable with brine and allowed to stand, preferably over night, to reach the most favorable equilibrium possible. Finally sufficient hydrochloric acid is added to bring the hydrogen ion concentration just to the acid side, thus freezing the equilibrium at the desired point. The mixture may

then be allowed to heat to ordinary temperatures without dissociation of the nitrile.

Aqueous hydrochloric acid converts the nitrile into alpha hydroxy isobutyric acid and ammonium chloride. This acid, now available commercially, has many interesting properties. It resembles lactic acid in most respects but differs from it in the fact that it retains its color when heated and can be distilled in vacuum without appreciable decomposition. It is a solid having a melting point of 80° C. and a boiling point of 212° C. at 760 mm. Being a solid at room temperatures it is readily purified by crystallization as well as by distillation and is thus easily separated from the ammonium chloride which is formed with it.

The nitrile also can be hydrolyzed to an ester by treatment with alcoholic hydrochloric acid. The esters of this acid are excellent nitrocellulose solvents and are more resistant to hydrolysis than the corresponding esters of lactic acid. The ethyl ester boils at 145° C. and the normal butyl ester at 182° C. The ethyl ester has been manufactured and sold by us under the name ethyl oxybutyrate.

We have attempted on a number of occasions to react hydrocyanic acid with unsaturated hydrocarbons of the aliphatic series. Addition of hydrocyanic acid to acetylene, for example, might be expected to yield the nitrile of succinic acid and addition to ethylene the nitrile of propionic acid. Such syntheses would have industrial application on account of the availability of the unsaturated hydrocarbons at comparatively low cost. Thus far, however, the work has not been successful.

An earlier chemical application of hydrocyanic acid was in the manufacture of the substituted guanidines, diphenyl and diorthotolylguanidine. These substances were at one time the most popular rubber accelerators and are still produced in considerable volume. In this process cyanogen chloride is reacted with the amine, aniline or orthotoluidine as the case may be, to produce the hydrochloride of the guanidine. The reaction is easily conducted and the synthesis eventually displaced the earlier process of manufacture which employed thiocarbanilid.

Cyanogen Chloride

Cyanogen chloride may be produced by the chlorination of almost any cyanide salt or of hydrocyanic acid itself, and the choice of raw material depends upon special circumstances. Hydrocyanic acid is somewhat more convenient. Dilute solutions are usually employed and the chlorination may be made in batch operation or continuously. A convenient continuous operation involves use of a tower with dilute hydrocyanic acid introduced at the middle section and water at the top. Chlorine and steam are admitted at the bottom, the temperature being controlled so that there is no loss of dissolved cyanogen chloride in the exit liquors. The water in the top of the tower removes traces of hydrochloric acid carried by the cyanogen chloride.

Besides its use in organic synthesis, cyanogen chloride may be employed as a warning gas in hydrocyanic acid fumigation, advantage being taken of its powerful lachrymatory properties. Mixed with hydrocyanic acid, it is sufficiently stable for shipment and its tendency to become acid is not undesirable in such mixtures. Shipment and storage of liquid cyanogen chloride itself requires further study. We have had explosions when working with highly concentrated cyanogen chloride and although the conditions for storage could probably be worked out, we have preferred to use the cyanogen chloride in gaseous form or in dilute solution in hydrocyanic acid.

Hydrogenation of Hydrocyanic Acid

The literature makes several references to the production of mono-methylamine by passing a mixture of hydrogen and hydrocyanic acid over platinum black. The reaction is $HCN + 2H_2 \rightarrow CH_3\,NH_2$. Since other methods for the production of methylamine are not particularly satisfactory, we have spent some time on the synthesis from hydrocyanic acid, and although the results have not been as successful as we could wish, we have, nevertheless, made progress. The most complete study of this reaction is by Barrett and Titley who employed as catalyst 20% platinum black deposited on asbestos. They found that variation in the composition of the catalyst affected the efficiency of the reduction but not the composition of the products; that increasing the temperature increased the efficiency of reduction; that increasing the temperature to 250° C. caused no appreciable change in the composition of the products; and that the ratio of hydrogen to hydrocyanic acid affected the composition of the bases produced, the greater this ratio the greater the proportion of mono-methylamine in the products.

We have continued this work, verified most of the conclusions of Barrett and Titley, and have operated a pilot plant for the commercial production of methylamine. The results, although fairly good, were not sufficiently so to justify a larger installation. Liquid phase hydrogenation was early abandoned in favor of vapor phase hydrogenation. Although much work was done on base metal catalysts, no really satisfactory combination was found. The hydrogenation of hydrocyanic acid is easy enough if one is satisfied with ammonia and methane as the end products, but if mono-methylamine is to be produced it is apparently necessary to keep the temperature very low, that is in the neighborhood of 200° C., and no base metal catalyst was found which was sufficiently active to give appreciable reduction at this temperature. Platinum oxide activated with ferrous chloride in the proportion of ten parts of platinum oxide to one of ferrous chloride is an active catalyst but not significantly better than platinum black. Palladium was

found to be very active but gave larger amounts of the higher amines. Platinum deposited on asbestos is sufficiently active for the purpose and gives only minor amounts of the secondary and tertiary amines.

Unfortunately, however, the activity of all of the catalysts studied decreases with time to a point where the conversions are no longer economical. This loss of activity is not due to ordinary catalytic poisoning but to smothering of the catalyst by tarry decomposition products. Catalysts removed from the apparatus after a few weeks of operation had gained as much as 20% in weight due to tar accumulations. This is due to formation of methylamine cyanide on the surface of the catalyst which decomposes, forming brown or black products of the same nature as those formed in the decomposition of liquid hydrocyanic acid. Regeneration of catalysts contaminated with this tar was not a simple task. It was easy enough to remove the tarry matter from the catalyst by heating it in air or oxygen, but the catalysts so cleaned were no longer active. Operating at 150° to 175° C., mono-methylamine represents over 80% of the reduction products. The most efficient gas mixture contained 8% hydrocyanic acid and 92% hydrogen.

The examples which have been given are merely typical of the variety of reactions in which hydrocyanic acid takes part. Many other reactions could be described, but sufficient has been said to indicate the versatility of hydrocyanic acid in organic synthesis, and it is my hope that these examples will stimulate research looking toward further uses for this interesting chemical compound.

Enlarged Sulfate Production in the Netherlands

The Netherlands has risen to an important place in the international situation in ammonium sulfate production, according to Commercial Attache J. F. Van Wickel stationed at the Hague, in a report to the Department of Commerce at Washington.

For many years Germany has been the leading export supplier, followed by the United Kingdom and the U. S., in the order named. In 1930 the Netherlands became an exporter of importance and now occupies third place in world sulfate export trade.

The enormous rise in Netherland exports in the last two years results from the establishment of three large production units. The year 1930 was the first of production on a large scale and although the new industry had hardly reached its stride exports exceeded 1929 by 179 per cent. Last year production was increased, and notwithstanding abnormal domestic and foreign marketing conditions resulting rom the breakdown of the international nitrogen cartel, exports advanced 177 per cent over 1930 shipments and 674 per cent over 1929.

A study of the table which follows shows that net imports during the period 1926-1929 averaged 81,858 metric tons whereas in 1930-31 there was a net export averaging 71,571 tons:

Netherland Foreign Trade in Sulfate of Ammonia

	Imports		*Exports*	
Year	*Metric tons*	*1,000 florins*[1]	*Metric tons*	*1,000 florins*[1]
1926	78,721	9,550	25,418	3,505
1927	108,200	11,420	35,436	4,434
1928	139,105	14,416	31,318	3,767
1929	126,473	12,420	32,896	3,604
1930	30,720	2,872	91,792	8,623
1931	172,614	7,536	254,685	17,249

[1]Florin averaged $0.401 in 1926, $0.4011 in 1927, $0.4022 in 1928, $0.4016 in 1929, $0.4023 in 1930, and $0.40228 in 1931.

EDITOR'S CORRESPONDENCE

COPPER SULFATE COSTS

Editor "Chemical Markets,"

My attention has been called to the article in your March number, entitled: "Copper Sulfate Price is Lower." I believe this article is the same that you discussed with me prior to publication. At that time I did not give it the attention which it deserved and this is to be regretted because present prices are not higher but lower than they should be as compared to prices when Copper was higher, your mathematical demonstration to the contrary notwithstanding.

The cost of producing Copper sulfate is made up of two factors as follows: (a) Copper content value, about 25% of $CuSO_4$; (b) Conversion charge, including acid, labor, steam, package, etc.

The first is a variable, depending upon the price of electrolytic Copper. The second is fairly constant from week to week and year to year. We doubt whether American producers can convert into marketable, 99% Copper sulfate, in suitable packages, at much, if any less than 1.50 cents per pound. Small producers will have higher costs.

Comparing costs when Copper was 14 cents and the cost today with Copper at 6 cents, we find the following:

Copper @ 14c: Value of Copper content @ 25%=$3.50, plus conversion charge $1.50=5c.

Copper @ 6c: Value of Copper content 1.50c plus conversion charge 1.50c=3c.

In other words, you assumed the whole cost of the sulfate varies as does the price of Copper, which is not the case. Foreign producers' prices would not remain at the present level, if they could manufacture at $2.23. Competition is too keen for that.

NICHOLS COPPER CO.,
April 12, 1932. G. P. Hitchcock,
Assistant Secretary.

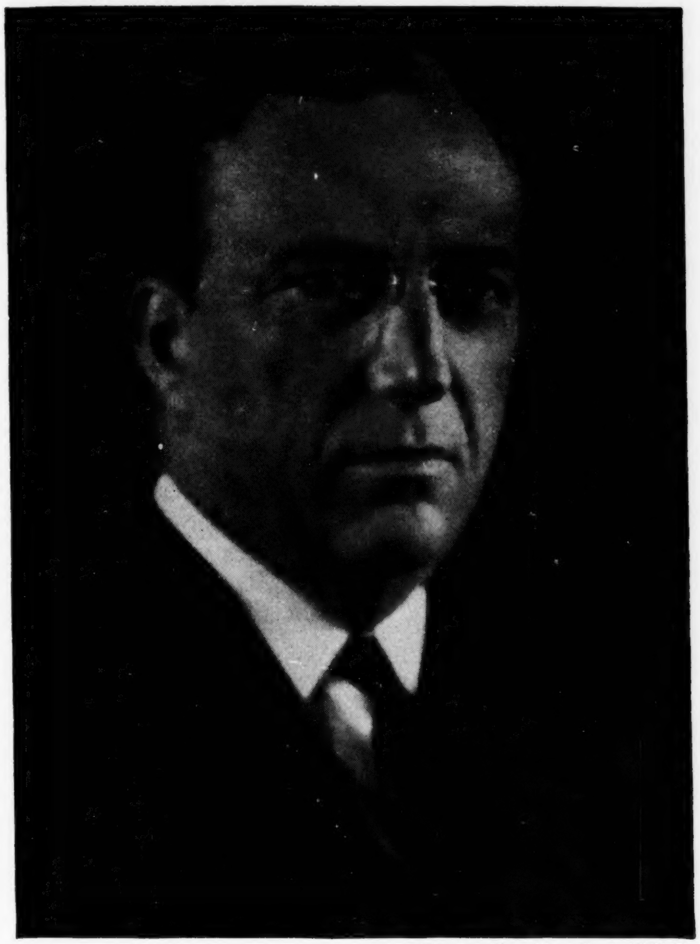
Note: Following this discussion of conversion costs, the article in question goes on to say: "The cost of manufacture—labor, acid, equipment, overhead, selling expense—is practically the same when copper sulfate is selling at $6.00 as when it is quoted at $2.75. As the price declines the margin out of which the sulfate manufacturer must cover these charges becomes progressively smaller. This is the explanation of the $2.75 price." Apparently this explanation was not clear, and we are glad to publish Mr. Hitchcock's detailed calculations.

Metropolitan Life Insurance Co., N. Y. City has issued a valuable survey of methods for improving dealer accounting practices.

The British Fire Prevention Committee issues the following warning *re* coal storage:

"(*a*) Stacks should not be higher that 10 ft. (*b*) Perforated iron or earthenware pipes 3 to 4 in. in diameter should be built into the coal mass vertically, with the lower ends at varying heights above ground. One pipe per 300 sq. ft. of surface will suffice. (*c*) Maximum thermometers should be lowered occasionally through these pipes to ascertain temperatures at different levels. (*d*) If wet, very small, or impure coal is received, it should be dumped around the edges of the stack so that air can circulate around it, and no other coal should be placed on top.

"Other precautions are as follows: (1) Avoid external sources of heat, such as hot pipes through mass or underground. (2) Allow no fluid to leak on to stack. (3) When temperature rises to 35 deg. C., remove top layers and watch heap carefully, using as soon as possible. In case a fire has started: (1) Fine should be disturbed as little as possible. (2) Water should be applied to the seat of the trouble only, especially when the coal is in a confined store, otherwise spontaneous ignition may occur later."



—*Courtesy Executives Service Bulletin*

Finding New Markets

By L. A. Yerkes

Bigger sales records are few and far between these days, but Cellophane has gone ahead developing new markets so that what the President of the Du Pont Cellophane Company has to tell about how to discover new buyers is of double interest in chemical circles.

SUCCESS in marketing a new product is oftentimes in inverse ratio to the number of obstacles to be overcome. If markets which offer few obstacles can be discovered, then the selling job becomes easier than it would be in markets offering many hurdles. In introducing transparent Cellophane, it has been our objective to determine which markets offered fewest obstacles—those whose products most required visible protection. There is only one way to obtain these facts and that is by investigation. Our program, therefore, includes investigation as one of its important parts.

Take, for instance, cigars. Prior to the perfection of Moistureproof Cellophane, cigars had to be "nursed" in humidors all the way from factory to smoker and, even with these precautions, many became dry and tasteless. Extensive laboratory tests of sets of cigars of all types—some in Cellophane, some unwrapped—were conducted. Low humidity and high temperature, duplicating the worst possible climatic conditions of the country, were used. Every few days a set of cigars was passed out to smokers to try and to compare.

The smokers were in agreement with the laboratory—the delicate scales had confirmed the fact that the original moisture content of cigars, soon dissipated when unwrapped, was retained substantially by the new wrap.

With these experiments as a background, cigar companies made their own tests and decided to try out their cigars packaged in the new wrap. Smokers tried them, noted the improvement the wrap produced and thereafter looked for cigars in moisture proof packages. Other companies followed suit and, in a period of just a few months, a nation-wide army of cigar smokers became "package conscious."

The investigation program has had two main sections: (*a*) Technical Laboratory tests, (*b*) Sales Laboratory tests.

In the technical laboratory, the protective features of the moisture proof package have been gauged on a wide variety of items—from cake to soap flakes. "Will my cereal keep better in Cellophane?" asks an interested manufacturer. Into the laboratory goes the series of test units of the product, some wrapped as at present, others in Cellophane. A few weeks pass with test recordings day by day. The records are plotted, the comparison shown. The cereal maker has his answer.

This technical laboratory easily could be considered as a functioning member of the sales force. Its equipment consists of such items as hot plates, vacuum pumps, analytical balances—some of them so delicate that they will respond to the slightest variation of moisture in even such feather-light products as cigarettes—drying fans and desiccators,

as well as such commonplace accessories as slide rules and test tubes. There is a refrigerator capable of maintaining a temperature as low as five degrees Fahrenheit, an oven heating up to 240 degrees, quick-freeze chambers, large humidifying chambers and a technical library on food products of all kinds. The laboratory uses, also, an orsat, a complicated piece of apparatus for measuring carbon dioxide gas, at present the only scientific means of determining the freshness of coffee.

Securing Consumer Reactions

And the sales laboratory? "Will my biscuits sell better in Cellophane?" inquires an executive of a bakery. Yes or no? Onto typical store counters go the biscuits—first, for a specified period, the present units, then in the "visible" wrapping. Sales are clocked, summaries studied, conclusions drawn. The sales test report gives the solution the biscuit baker seeks.

It should be emphasized that, in securing the reaction to new uses of our material, we are firm believers in getting to the source of accurate data in the dealer's store and in the home. The facts secured are complete; neither time nor cost is spared to provide them.

Further testing by the user is advocated as concerns start employing our product on items on which little experience is available. Our policy is to encourage limited trials prior to the main adoption. When a difficulty crops up, it is usually in the initial stages and, when operations are on a limited basis, the trouble is studied easily and the remedy simple to apply, so that the regular production goes ahead and the difficulty is eliminated. Of course, it takes patience for the new Cellophane user to check each step until testing days are over, but, if he does, the certainty of success will be much greater when his full production starts.

A very interesting application of our test practice is our Package Development Department. Originally, when a concern wanted to try Cellophane on a package, we sent the samples and the concern did the packaging. Some of the results were not very flattering—to either the concern or Cellophane. So the process has been reversed. Today, the concern sends us its product and, by thorough trial in the Package Development Department, the application of Cellophane most adapted to the products' needs is worked out. The problem is turned over to artists, designers, and packaging experts with a background of many similar problems, and there emerges a package that is as near right as experience permits.

Safe Packaging Merits Thorough Testing

Hours of work are necessary, but they save the waste and disappointment which often are the results of a poorly designed package. No charge is made for this service, and over a hundred companies use it each month to pre-test their package plans.

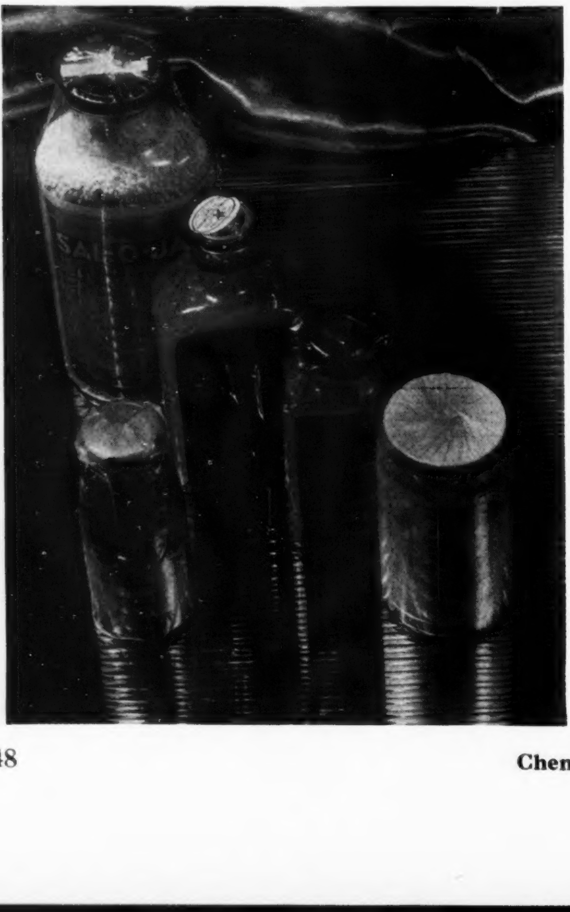
It is not the invariable rule that our tests result in findings favorable to Cellophane. Although it has been so termed, Cellophane is no miracle. The tests may definitely show that fundamentally it belongs on a product and that the field being surveyed is one into which we may enter profitably.

If they do not, we have advance warning of obstacles ahead and can turn our effort at the moment in a direction where barriers are fewer.

I believe that I am safe in saying that a given amount of sales energy expended in fields representing the fewest number of obstacles will produce the highest ratio of results. It is, therefore, evident that our plan of testing for obstacles is basically sound.

Just now, our organization is "coffee-minded" and "butter-minded." Industries concerned with these products are showing interest in Cellophane. Coffee and butter packagings, therefore, are in our technical laboratories undergoing all kinds of experiment. In our test stores, too, customers are voting for or against the packages of butter and coffee in Cellophane. The results coming in give a real story for our sales development men to transmit to manufacturers.

In this present critical era for all business, our experience would point to the need for more emphasis than ever before on finding out where the product belongs before the selling actually begins.

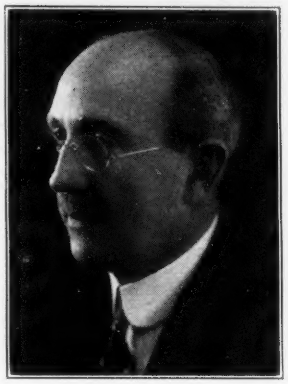


The uses of Cellophane during the past few years have become widely diversified, being used not only from the utilitarian point of view but also for improving the appearance of packages.

CHEMICAL N

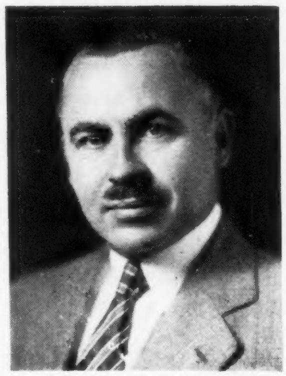
The Photographic Record of C

Dr. Carveth's retirement from Roessler & Hasslacher naturally brought reorganization of the executive staff and promotions to a number of men well known in chemical circles. The new president Charles K. Davis has come from the presidency of the Viscoloid Company, a post he reached after general managership of the Pyralin Department, and superintendency of the Hopewell plant during the war, thus he brings to the leadership of Roessler & Hasslacher, a thorough going Du Pont training and experience. He will have at his right hand Dr. E. A. Rykenboer who two years ago succeeded George Hasslacher's place on the Board, having joined the Roessler & Hasslacher forces, on the Research Staff at Niagara Falls back in 1917



Dr. Carveth's retirement was not unexpected as he has many personal interests and hobbies to which he has been anxious to devote himself after twenty-six years active service in charge of the Niagara plant and of their Technical Research, and since 1928 President

Vice President Milton Kutz, whose hobby is "selling chemicals at a profit" has spent his entire business life with Roessler & Hasslacher. In 1910, he was manager of the Philadelphia office and was brought to New York in general charge of sales in January 1922



Assistant Secretary, J. Carlisle Swaim entered the chemical field through the legal door and graduated from Columbia Law School in 1915 and after serving in the World War associated himself with Merrill, Rogers, Gifford and Woody until he became associated with Roessler & Hasslacher in 1928

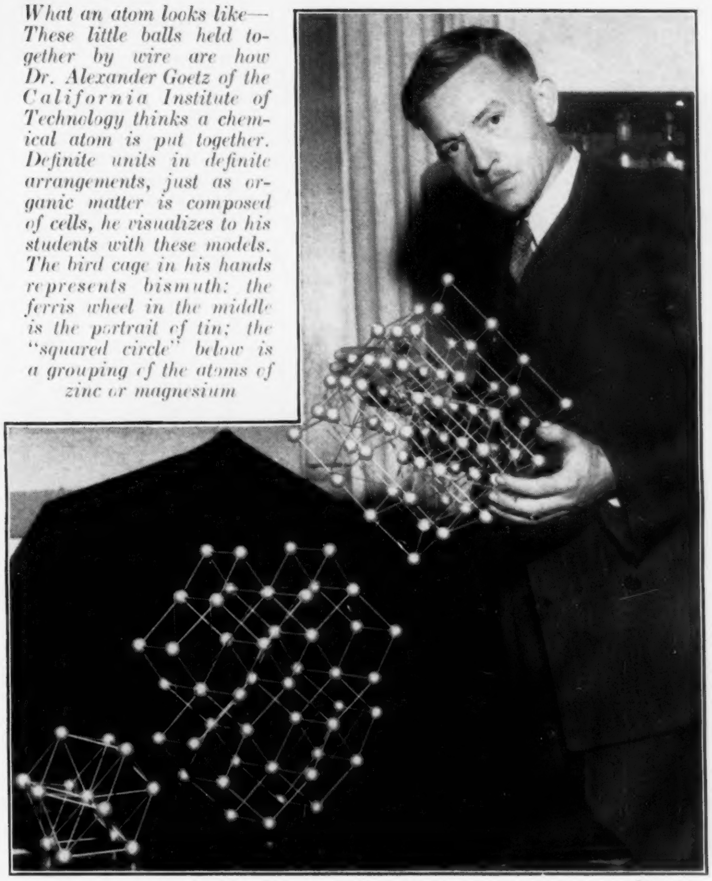
Albert Frankel, for ten years treasurer of Roessler and Hasslacher, is another executive who has been born and raised as it were within the ranks of the company, having joined the force on July 31st, 1891, his entire business career having been a steady climb to the responsible post of financial control within the Roessler & Hasslacher ranks

Dr. Mortimer J. Brown, retiring vice president and director, plans to devote himself to private research and consulting work after having been with the company twenty-one years in the Chemical Development Division, where his special interests have been cyanides, chlorine and its derivatives, insecticides, alkali metals and cyanogen fumigants

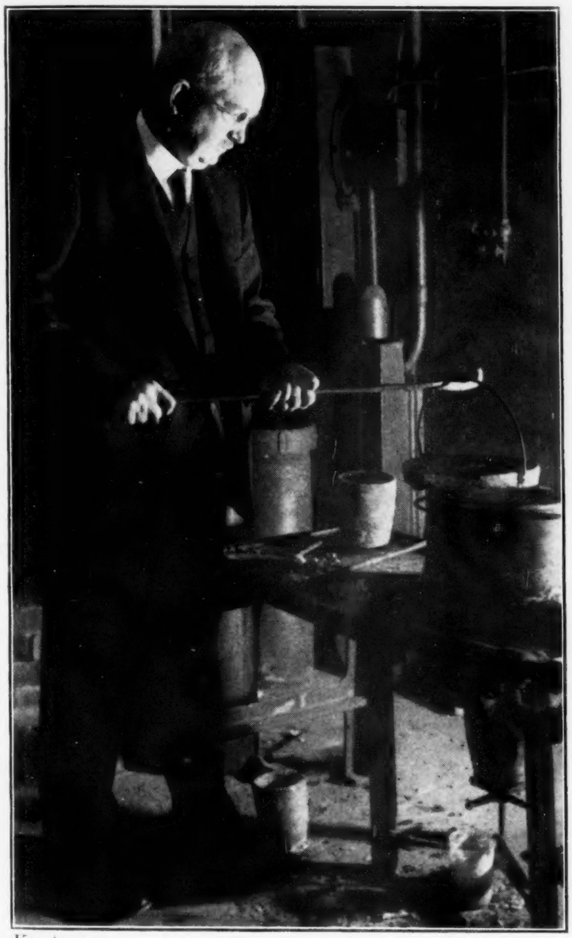
L NEWS REEL

rd of Our Chemical Activities

What an atom looks like—These little balls held together by wire are how Dr. Alexander Goetz of the California Institute of Technology thinks a chemical atom is put together. Definite units in definite arrangements, just as organic matter is composed of cells, he visualizes to his students with these models. The bird cage in his hands represents bismuth; the ferris wheel in the middle is the portrait of tin; the "squared circle" below is a grouping of the atoms of zinc or magnesium

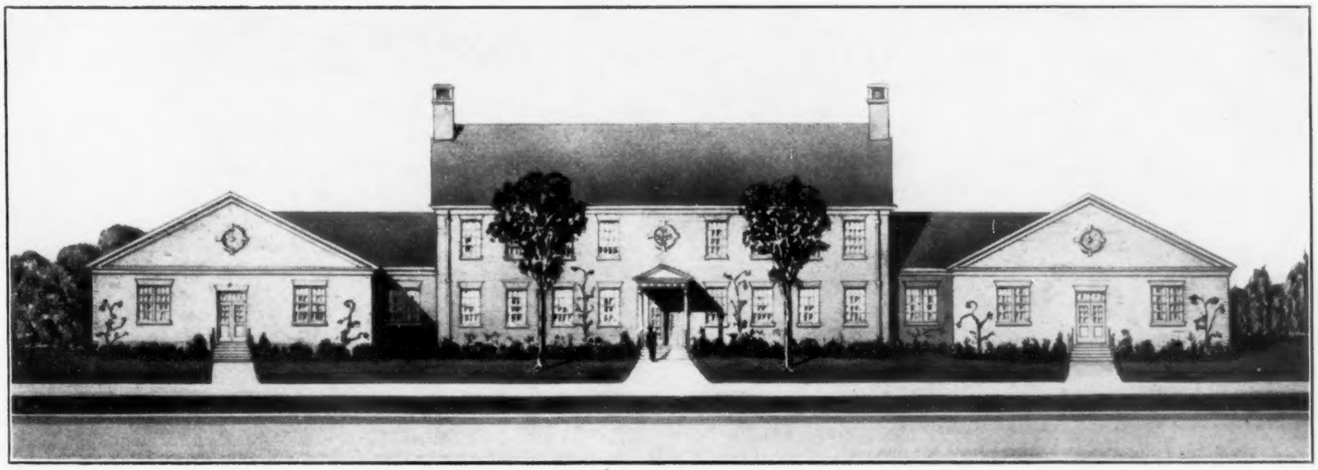


Keystone



Keystone

Bigger and better diamonds than those first produced in 1893 by Henri Moissan, have come out of this modern alchemist's shop at Columbia University, presided over by Dr. Ralph H. McKee. These synthetic diamonds are still too tiny even for sale at the five and ten, but being ten times as large as those produced by the famous French chemist are considered a long step toward breaking the world's diamond monopoly. This photograph deserves a place among the Chemists' Club's alchemical prints. Below—the Merck Research and Analytical Staff look forward to moving into this luxurious laboratory next year. In it will be centered the now scattered scientific and technological work of the company. In the center section, besides the headquarters and the library will be optical and physical laboratories, and one to study containers. The south wing will be devoted to the pure sciences of chemistry, bio-chemistry, and pharmacology, and in the north wing will be one large laboratory, 50 x 50 feet, devoted to applied research and development work with facilities for small scale plant operation



H_2

Hydrogen has "gone commercial" and its industrial uses, as Dr. E. F. Armstrong points out in this article, hold some profitable possibilities.

THE large scale uses of hydrogen at present fall under four headings:—(1) the hydrogenation or hardening of fats; (2) the hydrogenation of organic substances generally; (3) the conversion of nitrogen to ammonia; and (4) the hydrogenation of mineral oil and coal.

Fat hardening dates in theory from the discovery by Sabatier that the vapours of oleic acid when passed, together with hydrogen over heated, finely-divided nickel catalyst were converted into stearic acid, the so-called double bond between two carbon atoms CH:CH being reduced to CH_2:CH_2. After some research W. Norman was able to apply the reduction process to liquid fats, which contain glycerides of unsaturated acids converting them into solid fats like tallow.

The commercial advantage of the process is based on the fact that at the time of its invention the difference between the market price of tallow on the one hand and whale and certain liquid oils on the other, was as much as $75 to $125 per ton, and there was every indication that the world demand for hard oils was likely to exceed the supply. The cost of hardening was estimated to be of the order of $15 per ton. As so often happens, economic changes of another kind upset these expectations. The whaling industry was able to increase its prices, that of tallow fell, so that when the hardening costs had been added to whale oil, the profit margin became much less attractive. In the end the hardening industry has served to maintain a balance between the cost of hard and soft fats.

The hydrogenation of other organic substances than the fats is being practised to an increasing extent on a technical sale, and there is every indication that as the practical uses of the products so formed increase, the method will become one of prime industrial importance. It involves pure hydrogen, many catalysts and a knowledge of the same, a close control of the temperature and often increased pressure. The following table is a list of many substances hydrogenated and the product of the process: some of them cannot be prepared in quantity by any other method:

Substance	*Product*	*Uses*
Acetaldehyde	Ethyl alcohol	Solvents.
Acetone	Isopropylalcohol	"
Crotonaldehyde	Butylalcohol	"
Phenol	Cyclohexanol (Sextol)	"
"	Cyclohexanone (Sextone)	"
Cresol	Methylcyclohexanol	"
Naphthalene	Tetralin	"
Pyridine	Piperidine	Absorbs CS_2.
Nitrobenzene	Aniline	Dyes.
Indigo	Indigo white	Dyeing.
CO	Methanol	Solvents and
CO_2	"	Formaldehyde.

Most of the products are used in the ever-growing solvent industry, which has given the world the new cellulose lacquer paints and varnishes, or in the artificial silk industry. Their use is extending daily and leading to novel and valuable products of every day utility. Perhaps the most important on this list is synthetic methyl alcohol or methanol, which thus becomes a product of water gas and can be produced at a far lower cost than formerly when it was obtained as one of the products of the destructive distillation of wood. Besides its important use as a methylating agent, methanol is the raw material for formaldehyde, a chemical of the widest utility, one of its prime services being the manufacture of synthetic indigo.

Allusion should perhaps also be made to the potentialities of hydrogenating phenol and its homologues. If the low temperature carbonization industry succeeds, a profitable outlet will be required for the additional quantity of phenols produced. It is possible to hydrogenate them cheaply and rapidly and with a minimum of purification by the continuous

process so that the problem has rather become that of finding more extensive uses for cyclohexanol. These will no doubt be found, particularly when mass production makes it available at a lower price.

Conversion of Nitrogen to Ammonia

Regarding the conversion of nitrogen to ammonia, the process is simple enough, a mixture of the gases nitrogen and hydrogen suitably purified being circulated over a catalyst at a temperature of 500° and a pressure of 100-200 atmospheres. The ammonia formed during each passage is then scrubbed out. F. Haber established the equilibria of this reaction, but Bosch and the Badische Company worked out the practical application. In later days Claude and Casale have introduced modifications working at higher pressures of 800-1,000 atmospheres; under such conditions more ammonia is formed and it liquefies on cooling. The most up-to-date process is that of the Mont Cenis Company.

For economic success most depends on the cost of hydrogen which has been steadily reduced as the result of experience. Three rival methods of making it have been tried. The electrolytic, when very cheap power is available, is not yet out of the race. The most favored is the water gas process, but there are many believers in coke oven gas as the ideal raw material for hydrogen production. It is worth while discussing their relative merits if only as an example of the many factors to be considered in an economic question of this kind. Water gas is made by blowing air and steam alternatively over coke in a producer, it consists of hydrogen, carbon monoxide and some carbon dioxide. Study has been given to the reactivity of the coke and to the economical amount of steam. In the second stage of the operation after purification of the gas from sulfur, the carbon monoxide is oxidized to hydrogen and carbon dioxide by passing the gas mixed with more steam over an iron oxide catalyst: this is called the Bosch reaction. The resulting gas is compressed to 25 atmospheres and the carbon dioxide totally removed by scrubbing at first with water and finally with caustic soda. After compression to 200 atmospheres the small residual quantity of carbon monoxide is removed by washing with a solution of a cuprous salt and pure hydrogen at a suitable pressure remains. It is, however, more economic to mix water gas from the outset with such quantity of producer gas as will bring the hydrogen-nitrogen ratio of the mixture to the required figure of 3:1.

When using coke oven gas for ammonia synthesis all the constituents other than hydrogen and nitrogen are separated by the combined use of pressure and low temperature. The carbon dioxide is removed by washing at low pressure as above described. The gas is then fractionally cooled, whereby first the methane and then the carbon monoxide are removed. The nitrogen-hydrogen mixture when adjusted to the proper proportions is ready for use; the fractions separated by liquefaction may be united to form a residual gas which has the same calorific value as it had in the original coke oven gas and can be used for heating. In other words, a plant making hydrogen from coke oven gas gets a credit for the full fuel value of half the oven gas taken and has only to pay for half the gas and the cost of separation. Taking each process under the most favorable large scale conditions, the cost of hydrogen by either of them is much the same being about 1s. per thousand cubic feet.

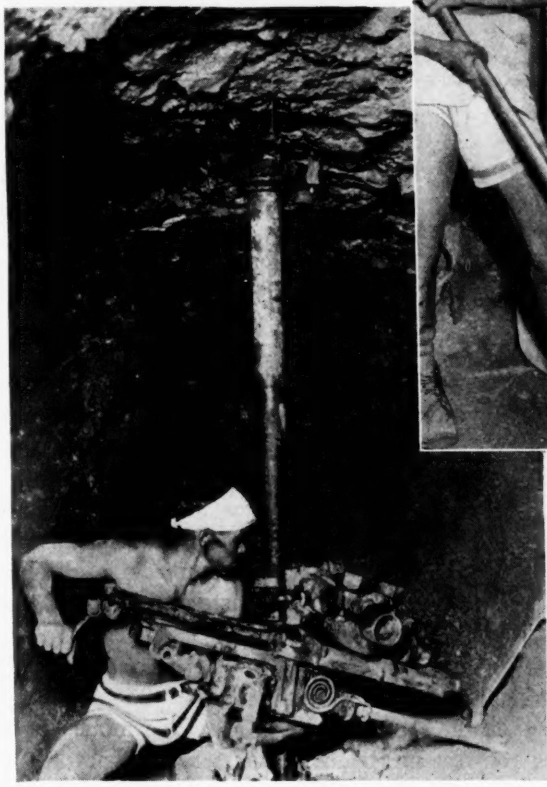
Bergius gave the first solution to the conversion of coal into oil. Coal made into a paste can be hydrogenated under pressure to oil and today a large yield of oil, mostly gasoline, can be obtained from a suitable coal. The by-product is mainly methane from which hydrogen can be made when it interacts with steam in the presence of a catalyst. The plant is an elaborate and costly one and so far the cost of producing gasoline is put down at 14c to 16c a gallon which has to compete with a price of less than 4c a gallon at the oil field. Such figures are only of passing import, the 14c will be reduced, the 4c may grow larger; what is important is that gasoline can be produced from coal at prices within practical bounds, so that oil could be produced from coal when circumstances required.

Hydrogenation of Tar

The second half of the problem is the hydrogenation of tar. This, as produced from coal either at a gas works or by low-temperature carbonization, contains less hydrogen in proportion to carbon than does natural petroleum. Such oil can be readily hydrogenated under increased pressure in the presence of a number of catalysts yielding a commercial quality of gasoline of high anti-knock value. Such low temperature oil can be hydrogenated more cheaply than coal and once it is available in really large quantities, a new oil industry could be built up on it. It is only produced, however, together with a smokeless coke fuel in such proportions as 20 gallons of oil to 13 cwt. of fuel; this fact makes the production of the oil, viewed from the commercial standpoint, essentially one of the production and sale of low-temperature fuel.

Many of the residues produced in refining oil are of low value; catalytic hydrogenation can convert these into much more valuable products. Large experimental plants have been built in America to study this question on a commercial scale and have met with success and there is every reason to suppose that but for the present glut of natural oil they would have become part and parcel, along with cracking and refining plants, of the oil industry.

Imports 216,600 Tons Production 700 Tons



Chrome Ore—13% of our consumption is in chemical processes—is shown in this market analysis by Walter J. Murphy to be a raw material of increasing industrial importance for which we are dependent upon foreign supplies.

FAILURE of the "Five Year Plan" in manufacturing should not obscure the fact that Russia is regaining her former position as an exporter of raw commodities, specially in the mineral field. Manganese, coal, oil, mercury, and now comes the news that the Soviet is re-entering the chromite markets.

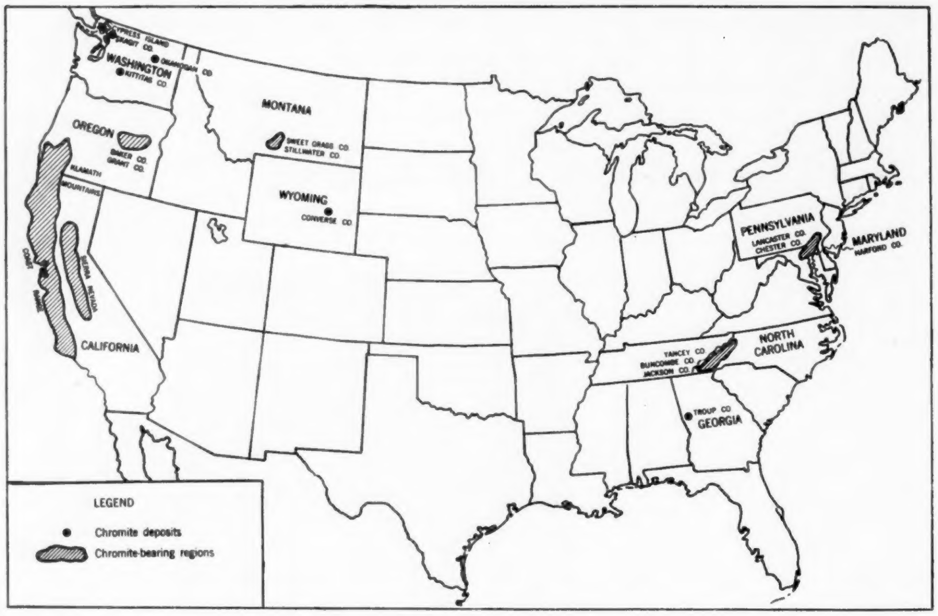
At the beginning of the century Russia dominated this field, producing over 22,000 tons annually, of a world total of approximately 50,000 tons. The Revolution ended this control abruptly. While Russian production estimated in the year 1929-1930 at 66,700 tons is but 11 per cent of present world production of 600,000 tons, her leaders are accelerating mining operations and the markets will feel this competition this year. Soviet exports to the United States increased 31 per cent in the first six months of the current year compared with the same period a year ago. Total Soviet exports for the same months jumped from 4,351 tons to 14,412 tons. Russian production is estimated to have increased 500 per cent in the past six years.

Are we in danger of the "dumping" of chromite ore in this country similar to the sales of manganese alleged by J. Carson Adkerson, secretary of the Manganese Producers Association in the recent hearings before the Senate Committee on Mines and Mining? Probably not; for the reason that chromite production in the United States is negligible despite the fact that we are the world's largest consumer. Although we are dependent upon other countries for approximately 225,000 tons of chromite ore annually the situation is not analgous to tin or rubber. We have fairly large supplies of ore in the United States, in Canada, and in Cuba. North American deposits now known are of a very low grade and cannot compete except under highly artificial stimulus and the use of domestic ore is purely one of economics. However, we are not entirely at the mercy of outsiders. In addition, although located in foreign fields, several of the most important deposits are controlled by American capital.

Consumption of chrome ore is largely in three fields—46 per cent metallurgical; 41 per cent refractory; and 13 per cent chemical. Taking 1928 as typical of average conditions, our imports were 216, 600 tons and domestic production, 700 tons; a total of 217,300 tons. In other words the metallurgical industry absorbed 99,580 tons, refractories 89,093 tons, chemicals 28,249 tons.

The past ten years has witnessed the rapid rise of southern Rhodesia to the position of the leading producing country, usurping the post of honor long held by New Caledonia. Reverting again to 1928 as an average year, Southern Rhodesia produced 195,900 tons, New Caledonia 56,000 tons, India 45,400 tons, Cuba 33,700 tons, Union of South Africa 31,300 tons, Russia 29,000 tons, Greece 20,600 tons. Yugoslavia, Turkey, Japan, and this country also reported small production. In all instances, with the exception of Russia and Yugoslavia, exports practically equalled production, indicating that large consuming countries are almost entirely dependent upon outside sources for supplies of high grade ore. Based on these figures

Southern Rhodesia exported 44 per cent of the world's total, New Caledonia 15 per cent, and India 12 per cent.



Chromium is in the group of relatively rare elements, closely related to molybdenum, tungsten and uranium. The metal chromium has few uses and has not been found as yet in the native state. Chrome bearing ores are fairly numerous and the large number of chemical combinations encountered adds to the complexity of endeavoring to adopt many for commercial uses. Chromite, a combination of iron and chromium oxides with the molecular composition $FeOCr_2O_3$ is the most desirable ore. It has a theoretical composition of 46.5 per cent Cr, or 68 per cent Cr_2O_3 and 32 per cent FeO. In nature it is most often found contaminated by magnesium, aluminum, or iron in the ferric state.

Favorable Position of New Caledonia

The desirability of chromite is, in most instances, determined by the ratio of iron and chromium and the usual ratio of chromium to iron is about 2½ to 1. Iron in greater concentrations renders the ore unsuitable for use in refractories, ferrochrome steels, and manufacture of chemicals, Silica in larger quantities than 5 per cent is also undesirable. A high grade ore is usually considered to be one analyzing at least 48 per cent chromium sesquioxide. Domestic and Canadian ores now known fail to reach this minimum. The highest grades of ore are desirable for the production of chemicals and New Caledonian ore is generally considered best for this purpose.

Reasons for Thirty Years' Growth

The enormous expansion occurring in thirty odd years in chrome ore tonnages mined (50,000 in 1901 and nearly 600,000 in 1930) has been made necessary in a large degree by the introduction of chromium alloys ferrous and non-ferrous. It is beyond the scope of this article to discuss in detail the advantages of these, but chromium adds to the toughness, hardness and increases the resistance to oxidation and corrosion.

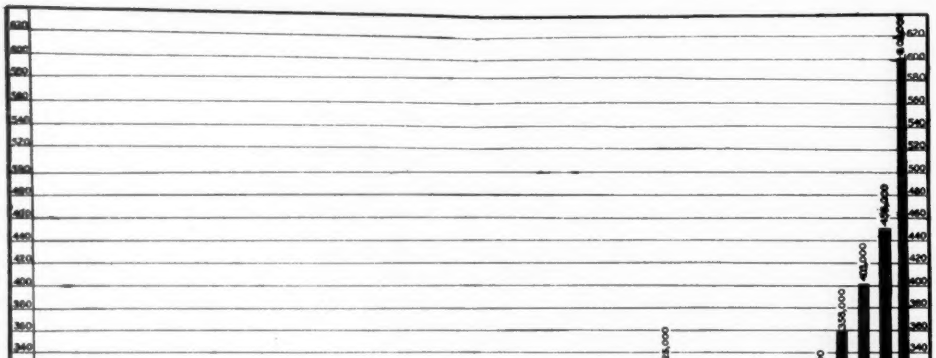
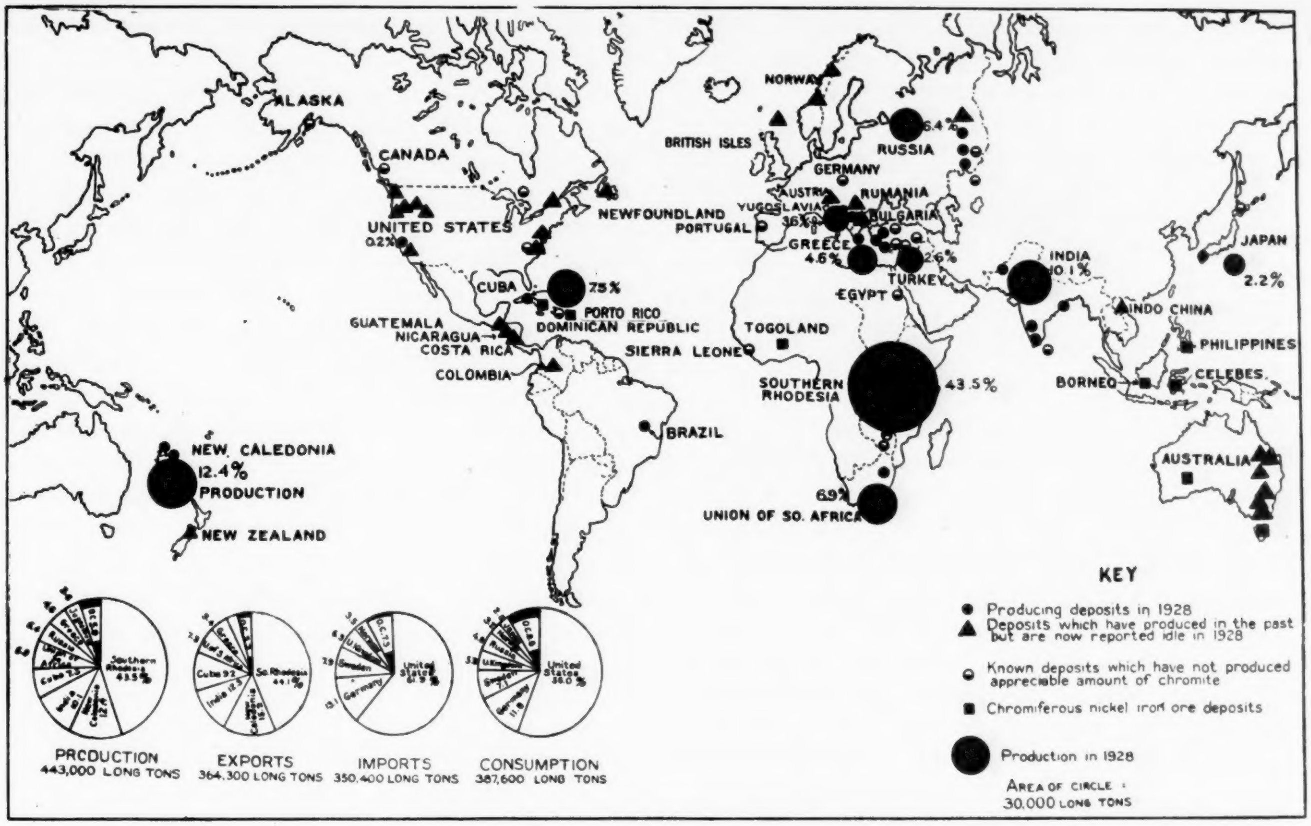


Figure 2. World Production 1890-1929

The use of chromite in the manufacture of refractory materials, such as brick and cement is based upon its chemical stability. It does not enter easily into chemical reactions with either silica or magnesite. Chromite refractories have a fairly high melting point, relatively high thermal conductivity and relatively low electric resistivity. The manufacture of refractory articles is



the one exception where an ore high in silica (not over 10 per cent) may be desirable. The chemical and chemical process industries employ chromite refractories in many operations and in a large number they are indispensable. One of the very latest applications is that of a lining kilns for drying sulfite paper pulp. The expansion of the chrome brick refractory industry has to a great extent been at the expense of magnesite. It is estimated that the former is now at least a dollar a square foot cheaper. Magnesite is often preferred, however, for points subject to extra mechanical erosion. The use of chrome brick and chrome cement for refractory purposes is growing rapidly.

The chrome chemical manufacturer desires an ore of at least 47 per cent Cr_2O_3, one free of sulfur, low silica content, and one friable, that is, easy to crush. Most of the chrome ore going into the chemical division is employed in the manufacture of sodium bichromate and to a much less extent potassium bichromate. In most of the consuming industries the sodium or potassium salts are interchangeable, but preference is given to the former because it is cheaper. Practically all the other chromium compounds of commercial importance are produced from bichromate of soda.

The uses of bichromate, in addition to the production of such commercial chemicals as chromic acid, chromium sulfate, chromium chloride, chrome alum and chromium acetate, are numerous. Chrome tanning of leather, manufacture of one-bath tannage (a mixture of bichromate and other ingredients employed by some tanners in place of bichromate direct) manufacture of chrome yellows, greens, zinc chromate, barium chromate and zinc green; in the manufacture of chrome dyes, intermediates, in the brass industry, in the manufacture of synthetic perfumes, in etching, as a bleaching agent and in certain boiler compounds. A limited tonnage of sodium and potassium chromates is produced for use in the manufacture of other chemicals, in dyeing, for the treatment of feed water and for the elimination of rust and corrosion in brine systems of refrigerating plants.

By far the tanning and dry color industries are the largest consumers of bichromate of soda. It is difficult to estimate which of these is first but it is quite likely that the tonnages going into the manufacture of colors now slightly exceeds that employed by the leather industry. Between them they account for about 80 per cent of the total consumption as far as it is possible to determine.

Production of sodium bichromate and chromate in recent years as given in the Census of Manufactures prepared by the Department of Commerce was as follows:

Year	*No. of Producers*	*Tonnage*	*Value*
1929[1]		37,401	$4,891,469
1927	5	31,462	3,780,435
1925	5	27,820	3,780,435
1923	5	26,879	3,994,566
1921	9	18,169	3,823,465
1919	5	22,992	5,337,389

[1] Preliminary figures.

Production figures for chrome yellow, chrome orange and chrome green for the alternate years beginning with 1923 are as follows:

Year	Chrome Yellow No. of Estab.	Chrome Yellow Pounds	Chrome Yellow Value	Chrome Green No. of Estab.	Chrome Green Pounds	Chrome Green Value
†1929		14,412,920	$2,147,139		16,063,376	$14,114,248
1927	23	14,334,423	2,351,111	24	14,114,248	2,460,276
1925	24	14,231,374	2,414,938	23	12,610,178	2,231,168
1923	27	13,238,317	2,379,338	23	*13,078,252	*2,291,753

Year	Chrome Orange No. of Estab.	Chrome Orange Pounds	Chrome Orange Value
†1929		9,231,605	$1,405,044
1927	19	4,652,209	751,468
1925	15	1,844,541	340,047
1923			

†Preliminary Figures.

*Chrome green and chrome orange.

Statistics are also available showing not only the total production of the three most important chrome colors but also the geographical distribution of production. New York, New Jersey, Illinois and Pennsylvania are the states showing the preponderance of production. The latest figures are for the year 1927 and while these are four years old they do give a fairly accurate picture of the industry under normal conditions. States where only a single producer is operating have been grouped together in order not to divulge confidential information.

Year 1927	Chrome Yellow No. of Estab.	Chrome Yellow Pounds	Chrome Yellow Value	Chrome Green No. of Estab.	Chrome Green Pounds	Chrome Green Value
Total	23	14,334,423	$2,351,111	24	14,114,248	$2,460,276
N. Y.	6	5,763,092	931,948	6	6,197,417	999,918
N. J.	5	5,245,136	848,096	6	3,076,836	605,087
Illinois	5	2,185,516	376,366	5	2,882,294	424,098
Penn.	3	565,898	98,152			
All others	4	574,781	96,549	7	1,957,701	431,173

Year 1927	Chrome Orange No. of Estab.	Chrome Orange Pounds	Chrome Orange Value
Total	19	4,652,209	$751,468
N. Y.	4	1,214,595	205,529
N. J.	5	2,893,517	447,490
Illionois			
Penn			
All others	10	544,097	98,449

*Preliminary figures.

Examples of the remarkable growth in chromium electroplating are before our eyes daily, on the automobile, on the breakfast table, in the shop and on the fixtures in our homes and office buildings. Large quantities find application in precision instruments of diverse uses—so-called hard plate. Concrete evidence of the expansion of chromeplating despite a certain amount of competition from chrome or stainless steels is to be had from the production figures for 1929 and 1927.

Year	*No. of Estab.*	*Pounds*	*Value*	*Average Price*
1929		3,612,980	614,492	$ .17+
1927	6	898,093	241,965	.26+

The remaining chrome chemicals are of relatively slight importance. Chrome alum is still employed to some extent in the tanning of certain leathers but the tonnage is quite small. Abroad the consumption is much larger. Chromium sulfate, chromium chloride and chromium acetate are used as mordants in dyeing and the sulfate and chloride in small amounts in chromium electroplating work. In 1929 the value of miscellaneous chrome chemicals was estimated to be $177,236.

Production and consumption of chrome ore has increased twelvefold between the years 1901 and 1930. Industries and products have developed in this thirty year period which are now indispensable. The question of adequate reserves is one of great importance and of mutual interest to producers of chrome products and consumers alike. The problem of conservatively estimating world resources is rendered extremely difficult because of the wide variations of deposits. Millions of tons of chrome ore of low chrome content are valueless today because ore of higher concentrations is easily obtainable. Should these become exhausted and no new high chrome content deposits be discovered, it will be necessary, of course, to fall back on the poorer grades.

The accompanying table gives some idea of the reserves in the countries now producing. It is of necessity very sketchy and about the only safe conclusion that can be drawn is that there is an adequate supply of ore, generally speaking analyzing, at least 47 per cent for several decades to come. Reserves in Southern Rhodesia, New Caledonia, India, and possibly Russia will undoubtedly prove to be of such proportions that the problem of how to handle in a commercial way such low grade ore as exists in parts of Cuba, Canada, and the Philippines is one that is purely academic. Also it must be remembered that estimates are constantly being revised in those countries now turning out ore of 47 per cent or better.

Location	*Grade of Ore*	*Reserves known or Estimated*	*Political Control*
Alaska	Fair	227,900 tons	American
California	Poor	220,000	
California	Poor	220,000	
Montana	Fair to poor	400,000	
Oregon	Fair	62,000	
United States total	Fair to poor	909,900	
Southern Rhodesia	Good	Several millions	British & American
Union of South Africa	Fair	Several millions	British
New Caledonia	High	1,500,000	British & American
Cuba	Fair	100,000	American
	Very poor	3,000,000,000	
India	High	800,000	Mainly British
Russia	Fair to good	6,000,000	Soviet
Greece	Fair	Not estimated	French & American and Grecian
Turkey	Good	1-15,000,000	German, English Swedish, French, American
Japan	Fair	Not estimated	Japanese

Ore of very low grade exists in Canada, Philippines and Brazil.

*Charts and Maps reproduced from Bureau of Mines Circular on Chromite by H. R. Smith.

Association News

With the 83rd meeting of the A. C. S. past history association activity in this and other organizations was at a low point. Committees of the A. I. Ch. E. were busy in final preparation for the June meeting. In New York City the Chemists' Club held its annual meeting for the election of officers.

American Association of Cereal Chemists will hold its annual meeting, May 23 to 26, at the Statler Hotel, Detroit. R. T. Bohn is chairman of the local arrangements committee. The secretary of the Association is M. D. Mize, 836 Omaha Grain Exchange, Omaha, Neb.

The Sliding Scale of Chemical Trade

By Marcel Leveugle

Believe it, or not—in 1929, the world's chemical production was 40 per cent greater than in 1913 and chemical world trade was 30 per cent smaller than at the outbreak of the World War.

According to League of Nations statistics, the total world trade was greater, compared with 1913, by about 12 per cent in 1926, 21 per cent in 1927 and 22 per cent in 1928. These percentages express illusive variations. Adjusted by taking gold depreciation into account, the figures 112, 121, and 122 are only 78, 87, and 87 respectively. Thus world trade, just before the crisis, was in true value actually below that of 1913.

In striking contrast are the figures for the United States. Always taking 1913 as a basis adjusted for gold depreciation, total American trade (all imports plus all exports) recorded the following course, in true values: 1926, 151; 1927, 154; 1928, 154.

So, while total world trade had not in 1929 reached its 1913 level, the United States, the largest exporter, had succeeded in constantly increasing its exports. This reveals a great expansion on the part of the United States. In 1929, for instance, the United States exported 840 million dollars' worth of goods more than it imported, although these exports represented only 9.8 per cent of the domestic production, about the same ratio as in 1913.

The League of Nations publication, "Chemical Industry" May 1927, gives tables which show the rank of the leading chemical importers and exporters.* This publication gives the total chemical exports of the world for postwar years as 1913, 3.2 billion gold marks; 1924, 3.6 billion and 19,256, 4 billion.

After account has been taken of gold depreciation and price variation, the true values of the world chemical trade are a little less than two billion marks in 1924 and a little more than two billion marks in 1925, at the prices and gold basis of 1913. Thus international chemical trade was, in 1924 and 1925, in absolute value, about 30 per cent below that of 1913.

On the other hand, if exports are compared with production, in 1913, 3.2 billion gold marks' worth of chemicals were exported on a production of about 10 billions, *i. e.* 32 per cent, whereas in 1924, on a production of about 12 billions, 3.6 billions worth were exported, *i. e.* only 23 per cent. Obviously, for the world as a whole, home markets absorb now a larger fraction of chemical production than in 1913. Moreover, true values of world chemical production reveal a real increase. This confirms that domestic markets consume a larger percentage of national productions.

Before the War, Germany produced 24 per cent of the world chemicals, the United States 34 per cent, remaining countries 42 per cent. The United States now produces 47 per cent instead of 34 per cent, while both Germany and the "remaining countries" show decreased percentages. German chemical exports, however, are still the largest and represent a larger part of total German exports than before the War: 11 per cent in 1929; 9 per cent in 1913.

In 1928, the four largest producing countries (United States, Germany, Great Britain and France) exported 800 million dollars worth of chemicals, representing 80 per cent of the world total, valued at one billion dollars. These exports were absorbed as follows: 50 per cent by Europe, 20 per cent by the Far East, 20 per cent by North America, 6 per cent by South America.

The United States in the main supplies Canada, Central America, the West Indies and South America, exporting only 40 per cent for European consumption. Germany sells 50 per cent of its chemical exports to Europe. Great Britain ships 25 per cent of its exports to Europe but dominates the Far East and Africa markets. Sixty per cent of France's chemical exports are absorbed by Europe, the remainder principally by the Far East and South America. In 1929, the chemical exports of these leaders were estimated in millions of dollars: Germany 347; Great Britain 163; France 137. Germany, although in relation to world's chemical trade, its share decreased from 28.4 per cent in 1913 to 17 per cent in 1924; has climbed again to 26 per cent (average for 1921-29).

The United States, the largest producer of chemicals, is also the largest importer, although second to Germany as chemical exporter. During and since the war, the United States succeeded in displacing many

imported chemicals—chiefly coal-tar products—with its own products, yet, the proportion of exports to production is still astonishingly small—less than one-tenth (even only 6 per cent in 1929)—whereas in Europe, total chemical sales abroad represent from one-fourth to one-third of the production. In 1928 and 1929, American production of "chemicals and allied products"** approximated 3 billion dollars, while exports were only about 200 million dollars. The American market alone is an enormous outlet and export is not so vital to America as to European chemical manufacturers.

Chemical Exports and Imports Compared

United States chemical imports are about equal in value to exports, but they represent only a small fraction of production. Although United States chemical imports are larger than those of any other country, the *per capita* figure is considerably smaller. The eight leading industrial European countries have together a total chemical production approximately equal to that of the United States, yet, they have to import chemicals to a value twice that of United States imports. Since chemical exports of the United States equals chemical imports—in 1929, 6 per cent of the production was exported and replaced by an equal value of imports—therefore, 94 per cent of the domestic demand in chemicals is gratified by 94 per cent of the national output.

The accompanying table gives the apparent and the true variations in the American chemical trade and production showing plainly that the United States is becoming more and more self-sufficient. Chemical imports have grown according to apparent percentages, but are, in fact, in true value, only at their 1913 level, and in percentage of production, they have decreased from 15 per cent in 1913 to 6 per cent in 1929. On the contrary, exports have increased in true value, while in percentage of production, they have decreased only from 9 to 6 per cent.

Chemicals and Allied Products
(Table for the United States)

	1913	*1925*	*1927*	*1929*
Exports	79,000,000	158,000,000	184,000,000	204,000,000
Variation from 1913				
Apparent variation		+100%	+133%	+158%
True variation		+ 1%	+ 27%	+ 38%
Ratio to production	9%	7%	5%	6%
Imports	124,000,000	201,000,000	199,000,000	225,000,000
Variation from 1913				
Apparent variation		+ 62%	+ 60%	+ 81%
True variation		— 17%	— 14%	— 3%
Ratio to production	15%	8%	6%	6%
Exports and Imports	203,000,000	359,000,000	383,000,000	429,000,000
Variation from 1913				
Apparent variation		+ 77%	+ 89%	+111%
True variation		— 10%	+ 2%	+ 13%
Production	816,000,000	2,278,000,000	3,352,000,000	3,676,000,000
Variation from 1913				
Apparent variation		+179%	+311%	+350%
True variation		+ 43%	+122%	+135%

The larger part of American chemical imports is now of raw products or of semi-manufactured products, as compared with 1913—therefore, fewer foreign finished chemicals penetrate the American market, while American chemical exports include a growing proportion of finished chemicals (packaged goods and chemical specialties) hence fewer raw or semi-manufactured products (in percentage).

Comparing now the percentages of the accompanying table for the United States with the world figures indicated in the early part of this article, the following conclusions are reached:

1. The apparent increase of the world total chemical production between 1913 and 1929 is about 150%, *i. e.* a true increase of between 35 and 40%. The United States recorded 350% (apparent variation) and 135% (true variation) for the same period.

2. The total chemical trade of the world showed in 1924-25, an approximate 30% true decrease from 1913, while the foreign chemical trade of the United States (exports plus imports of "chemicals and allied products") revealed a true decrease of only 10%, imports recording a decrease of 17%, exports an increase of 1%.

3. For the peak year, 1929, as compared with 1913, the true variations of the American chemical trade are:

Total exports and imports:	increase	+ 13%
Exports alone	increase	+ 38%
Imports alone	decrease	— 3%

These figures reveal the growing independence of the American chemical industry.

4. Finally, the United States now consumes a larger proportion of its own chemical production, and in addition, now consumes more chemicals, in true value, than before the war; indeed, imports decreased from 15% of production to 6% in 1929, while exports decreased somewhat less and production recorded a true increase of 135% during the period.

From the above deductions, we conclude: the United States, the largest chemical producer in the world, as well as the first consumer, endeavoring—like other industrial countries—to become more and more self-supporting, has acquired the greatest chemical independence in the world, although its enormous imports place it as the largest chemical importer. The United States, moreover, has the largest total exportation (all merchandise) in the world, and if it only ranks second as exporter of chemicals at the present time, its considerable potential of expansion may, in the near future, place it in first place.

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*The League of Nations includes in the chemical industry the following products: heavy chemicals, fertilizers (except potash), coal-tar dyes and intermediates, mineral colors, varnishes, explosives, pharmaceuticals, artificial mineral waters, essential oils and perfumes, cosmetics, gelatine and glue, photographic chemicals, chemical cleaners, plastics, artificial silk.

**"Chemical and Allied Products" include: Naval Stores; all gums, pigments, paints and varnishes, industrial chemicals and chemical specialties, medicinal and toilet preparations, crude drugs and botanicals, waxes, essential oils, fertilizers and fertilizer materials, explosives, pyroxylin plastics, matches, coal-tar products, both crude and refined.

The Cellulose Ethers

Properties of the Different Ethers and Patent References

By Charles E. Mullin, Ph. D.
and
Howard L. Hunter, Ph. D.

So far, only aliphatic or open chain cellulosic ethers, particularly the methyl and ethyl derivatives have been considered. Within the past few years a great deal of investigation has been conducted on the aromatic cellulosic ethers, particularly benzyl cellulose. The benzyl ethers possess intrinsic properties which make them particularly useful as colloidal and plastic substances, for use in the manufacture of lacquers and films.

In 1919, Dreyfus was granted a patent[H] covering the substitution of one or more benzyl groups for a corresponding number of hydrogen atoms in the cellulose unit by treating cellulose with water, powdered alkali and benzyl chloride. This appears to be the first mention of benzyl cellulose in the literature.

Somewhat later the I. G. Farbenindustrie was granted a patent[I] covering a process for the preparation of benzyl ethers of cellulose by heating a benzyl halide with alkali cellulose, or with cellulose in the presence of an alkali.

Since the original patents were granted, several modifications in the previously described processes have been covered. In a patent[J] granted to Dreyfus the cellulose is impregnated with about four molecular equivalents of a 50 per cent solution of sodium hydroxide and this is thoroughly mixed with 2 to 3 molecular proportions of benzyl chloride. After heating at 50 to 100°C. for 2 hours, six more molecular equivalents of sodium hydroxide are added in powdered form, followed by the addition of more benzyl chloride. The resulting ether is soluble in chloroform and benzene. Benzyl bromide can be substituted for the chloride.

The I. G. Farbenindustrie has covered[K] the use of a solution of calcium chloride in treating soda-cellulose with benzyl chloride to prepare benzyl cellulose.

The catalytic action of phosphoric acid is covered by both Dreyfus[L] (French Patent No. 632,616) and the I. G. Farbenindustrie[M]. These patents specify the benzylation of cellulose in a vacuum, and then passing a gas such as carbon dioxide which would afterwards be absorbed by the caustic soda, through the material.

The Imperial Chemical Industries, Ltd., suggests[N] mercerizing the cellulosic material with an 18 to 20 per cent caustic solution, and pressing until the mass weighs 2.5 to 4 times the original weight of the cellulose used. The product is matured at 22 to 35°C., mixed with 50 to 100 parts of solid caustic soda for each 100 parts by weight of raw cellulose, and treated with benzyl chloride. It is claimed that by varying the maturing time and the temperature, within limits, products of different viscosities and solubilities can be obtained.

Scientific Research on Benzyl Cellulose

The first work of scientific importance on the subject of benzyl cellulose was that performed by Gomberg and Buchler[(6)] in 1921. Their general procedure in preparing the benzyl ethers of the carbohydrates is to dissolve or suspend the carbohydrate in water containing enough sodium hydroxide to keep the solution alkaline during the whole of the reaction. Benzyl chloride is added in the proportion of slightly more than one molecular weight of the chloride for each hydroxyl group in the carbohydrate used. The mixture is well stirred and after the reaction is complete, the excess of benzyl chloride is removed by steam distillation. When cellulose is employed as the starting material, they found it necessary to subject the cellulose to a preliminary so-called "hydration" process. The results of various experiments by these investigators indicate that, under varying conditions, the mono-, tri-, and tetra- benzyl compounds can be formed.

After this preliminary work on the general methods of preparing the benzyl ethers of carbohydrates, Gomberg and Buchler benzylated carbohydrates of all types, using the general method of heating the carbohydrate with a mixture of benzyl chloride and an aqueous solution of sodium hydroxide for several hours at about 90°C.

Nakashima[(20)] has prepared benzyl cellulose by treating cotton paper with a 40 to 50 per cent solution of sodium hydroxide, pressing out the excess of solu-

tion, and treating the soda-cellulose with a benzene or toluene solution of benzyl chloride. He states that in the presence of sufficient alkali and benzyl chloride, a practically quantitative yield of dibenzyl cellulose ether can be obtained. When the cellulose is treated with only a 10 to 20 per cent solution of sodium hydroxide, only one-half molecule of benzyl per anhydro-glucose ($C_6H_{10}O_5$) unit is introduced. On treating this product with cuprammonium solution, monobenzyl cellulose ether remains, the unaltered cellulose dissolving in the reagent.

Nakashima and Sakurada[(21)] found it very difficult to prepare the tribenzyl ether directly, but were able to prepare it from the dibenzyl ether by dissolving the latter in benzyl chloride and heating with silver oxide.

Properties of the Benzyl Ethers

According to Gomberg and Buchler[(6)], both the mono- and tri-benzyl ethers are insoluble in various organic solvents, but Nakashima[(21)] states that the mono- and di-ethers are soluble in chloroform, carbon tetrachloride and benzene, but insoluble in diethyl ether, ethyl alcohol, and water. The tetra-ether[(6)] is soluble in chlorohydrin, chloroform, nitrobenzene, and ethyl acetate, and is gelatinized by acetone. The mono-, tri-, and tetra-ethers are all insoluble in cold, concentrated hydrochloric acid[(6)]. None of the benzyl cellulose ethers reduce Fehling's solution[(6)].

Complex Aromatic Cellulose Ethers

By the action of *p*-chlorobenzyl chloride and 2, 4-dinitrochlorobenzene on alkali cellulose, Niethammer and Konig[(23)] were able to prepare the lower cellulose-*p*-chlorobenzyl and cellulose-2, 4-nitrophenyl ethers. The latter retains the fibrous structure of the cellulose and has a low nitrogen content. It appears that it should be possible to reduce the nitro-group in this compound to an amino group, which could be diazotized and coupled with a suitable amino or phenolic compound, thus producing the color in direct chemical combination with the fiber.

Mixed Aliphatic-Aromatic Ethers

In 1913, Dreyfus patented[O] a process for the preparation of mixed aliphatic-aromatic ethers of cellulose. In this process the cellulose is treated with sodium hydroxide in the usual manner, and then with benzyl chloride and diethyl sulfate. The latter compounds may be added alternately or in successive portions.

The I. G. Farbenindustrie has patented[P] a similar process in which the alkali cellulose is treated with a mixture of alkyl and aralkyl halides, such as a mixture of ethyl chloride and benzyl chloride. The proportions specified are 10 to 30 molecular weights of the former to 2 molecular weights of the latter, per anhydro-glucose unit weight of cellulose. The temperature and pressure are so regulated that the formation of free acid from the excess of alkylating agents is avoided. By this method it is possible to prepare an alcohol-benzene soluble ester from pasteboard pretreated with a 50 per cent solution of sodium hydroxide and then ripened.

Mixed Ether-Esters

Since the etherification and esterification of cellulose both take place in stages, it is easily possible to partially esterify and then etherify, or vice versa. For example, an ethyl group may be substituted for one atom of hydrogen in one of the three hydroxyl groups in the anhydro-glucose unit, so as to give a monoethyl cellulose ether of the formula $C_6H_7O_2(OH)_2.O.C_2H_5$. As these ethers are very stable and are not affected by weak organic acids, such as acetic acid, or by hot, dilute solutions of mineral acids, the remaining two hydroxyl groups may be esterified without affecting the ether groups. For example, the monoethyl cellulose ether can be esterified with acetic acid to give a mixed ether-ester, according to the following equation:

$$C_6H_7O_2(OH)_2OC_2H_5 + 2CH_3COOH \longrightarrow C_6H_7O_2\begin{cases} OOCCH_3 \\ OOCCH_3 \\ OC_2H_5 \end{cases} + 2H_2O$$

Courtaulds have patented[Q] such a process for the manufacture of mixed ether-esters of cellulose in which they first prepare a cellulose mono-ethyl ether in the usual way and this compound is then heated for 5 hours at 70 to 90°C. with glacial acetic acid. The resulting ether-ester gives a clear solution and is separated by precipitation. It is insoluble in cold water, but is readily soluble in benzene, alcohol, and other organic solvents. This patent also covers the preparation of other mixed compounds by heating a cellulose ether with formic or propionic acid. Sulfuric acid is specified as a suitable catalyst for the esterification.

A later process, patented[R] by Diamond and Glover, and assigned to Courtaulds, consists of first preparing a mono-ethyl ether which is insoluble in water, dilute alkali, and common organic solvents, and then acetylating this substance, using acetic anhydride in place of glacial acetic acid.

The first patent of the I. G. Farbenindustrie dealing with the preparation of mixed ether-esters[S] provides for the preliminary partial etherification of cellulose in the usual way. This product is then swollen or dissolved in an organic solvent and treated with an inorganic acid chloride in the presence of an acid-binding agent, such as an organic base, ammonia, magnesium oxide, or a carbonate. Ethyl cellulose benzoate is given as an example of this process. The patent also covers the preparation of ethyl cellulose silicate, containing 3.8 per cent of combined silica, by dissolving partially ethylated cellulose in xylene and

treating this solution with silicon tetrachloride in chloroform and pyridine.

Another method of preparing a mixed ether-ester has been patented[T] by the I. G. Farbenindustrie, in which a mixed cellulose benzyl ethyl ether is prepared and this compound esterified with acetic anhydride in the presence of acetic acid, as solvent, and a catalyst, such as sulfuric acid or zinc chloride. It is claimed that only a very small amount of catalyst is required.

Solubility of the Cellulosic Ethers

The specific solubility of some of the cellulose ethers has been mentioned briefly above. However, many other solvents have been suggested and patented, especially by the Eastman Kodak Company. The subject of solubility is especially important in connection with cellulose ethers since for use in plastics, synthetic yarns, varnishes, films, or celluloid-like articles, they are almost invariably dissolved in some solvent. These solvents have been listed in the accompanying tables together with the date, reference, and name of the patentee or discoverer.

[K] German Patent No. 494,917.
[L] French Patent No. 632,616.
[M] French Patent No. 656,861.
[N] British Patent No. 327,714.
[O] United States Patent No. 1,451,331.
[P] British Patent No. 305,946.
[Q] British Patent No. 241,679.
[R] British Patent No. 268,552.
[S] British Patent No. 300,942.
[T] British Patent No. 331,903.

Foreign News

The important foreign news item of the month was the increase of tariff rates imposed by Great Britain. Based on 1930 statistics, nearly $700,000,000 of American goods are effected by the decree of April 25th. To the general rise of 10 per cent levied a few months ago in the Abnormal Import Act, additional increases of 10 to 23⅓ per cent are added. General rates are now up to a level of 20 to 33⅓ per cent, a few cases as high as 50 per cent. Most chemical items will be assigned to the 20 per cent bracket.

Publication of the I. C. I. annual financial statement (see Financial Section for condensed balance sheet) indicates clearly that the company is holding its position in a favorable way despite conditions. Further, that business has shown signs of definite improvement in the last two months. Against a decline of 28 per cent in value of total trade of the seven leading manufacturing and exporting companies of the world, I. C. I. profits declined only 9 per cent. Sales of alkali products showed only a very slight decline when compared with 1930, while chlorine products including the chlorinated solvents actually registered an increase. I. C. I. fertilizer sales dropped less than 20 per cent. The statement made no direct references to either the hydrogenation process or to any special developments at Billingham (synthetic nitrogen plant).

A review of the German chemical industry by American Consul General W. L. Lowrie stationed at Frankfort-am-Main (headquarters of the I. G.) gives a very different interpretation of the chemical situation in the Reich from the one generally accepted. He reports in part that in 1931 Germany had the highest favorable trade balance in the history of the country, notwithstanding the depression. Chemicals contributed nearly 800,000,000 marks to this balance, being preceded by metals and metal goods, 1,500,000,000 marks, and machinery, 1,700,000,000 marks.

I. G. Farbenindustrie, the largest chemical factor in Germany, has been able to weather the storm of business depression relatively well. Reports issued during the year indicated satisfactory sales of dyes, pharmaceuticals, and photographic chemicals. The market for rayon was relatively good but depressed prices allowed a narrow margin of profit. In contrast to fairly successful results in the older branches of chemical production, the division of nitrogen fertilizers stood the brunt of the world crisis in this group.

The annual report, presented to the stockholders at the end of April, 1931, revealed that the concern had 251,430,000 marks worth of stocks of manufactured goods on hand, which consisted mostly of ammonium sulfate, the output of the Merseburg plant. Drastic retrenchments were effected in the production of this plant, and, according to an announced policy, the I. G. decided to reduce gradually the production of ammonium sulfate and increase the output of ammonium sulfate nitrate.

Production of synthetic gasoline was continued at a steady rate but resulted in a loss. An official communique of the I. G. stated that the depressed gasoline prices made the operation of this branch unprofitable, and were the import duties on petroleum products removed the I. G. could not see its way clear to continue this production at all.

I. G.'s financial situation was improved by a series of successful operations. By purchasing its own stock on the depressed market the management succeeded in reducing the capital stock in private hands by 85,630,000 marks, to 713,717,000. This reduction enabled the company, with less net profits, to pay the same rate of dividend as for the business year 1929—12 per cent. Liquid assets of the trust were reported at 160,000,000 marks. During the business year 1930, the concern paid off 12,440,000 marks of bank debts, thus acquitting itself of all such obligations.

The number of employees reported on May 1, 1931, was 79,772, with a payroll of 300,000,000 marks.

Export of chemical products declined 18 per cent in value, from 1,182,941,000 marks in 1930 to 974,446,000 in 1931. The following official statistics present a summary of German exports of chemicals by major divisions as adopted by the German Statistical Office.

German Exports of Chemicals, Pharmaceuticals, Dyes and Fertilizers

Item	*1930* *Metric tons*	*1930* *Thousand marks*	*1931* *Metric tons*	*1931* *Thousand marks*
Chemical elements, acids, and other industrial chemicals	1,984,055	278,065	1,658,602	238,567
Pigments, dyes, and paint materials	169,700	291,077	165,566	259,378
Varnishes, lacquers, and putties	10,970	21,817	9,985	17,019
Ethers, alcohols, essential oils, artificial perfumes, and cosmetics	22,692	50,515	24,241	45,170
Artificial fertilizers	2,813,371	348,486	2,106,501	236,281
Explosives, ammunition, and matches	9,260	24,206	6,635	18,585
Chemical and pharmaceutical products, not specially provided for	48,483	168,775	42,836	159,446
Total	5,058,531	1,182,941	4,014,366	974,446

The table omits several important classes of chemical products, notably crude coal-tar products, plastics, gums, resins, and waxes, which amounted to 336,133 tons, valued at 131,072,000 marks, in 1930, and 261,581 tons, valued at 105,174,000 marks, in 1931, but includes inks, crayons, and ammunition. Allowing for these readjustments, exports of chemicals and allied products from Germany in 1931 probably were about 15 per cent less than in 1930, and were valued at 1,070,000,000 marks, $254,000,000.

Fertilizers suffered the most substantial decline of all groups in the chemical industry, with a value loss of 32 per cent and quantity drop of 24 per cent. Exports of the more important classes were:

German Exports of Specified Fertilizers

Item	*1930* *Tons*	*1930* *Thousand marks*	*1931* *Tons*	*1931* *Thousand marks*
Potash, crude; Stassfurt salts	995,157	60,226	540,878	30,790
Potassium sulfate	482,396	73,226	355,277	50,837
Ammonium nitrate	9,712	3,486	7,262	2,233
Sodium nitrate	65,196	12,337	51,895	8,412
Potassium nitrate	26,000	8,904	36,247	12,028
Ammonium sulfate	463,683	86,489	664,930	74,640
Calcium cyanamide	6,353	962	379	70
Disodium phosphate, ammonium phosphate, and similar fertilizers	36,475	13,973	23,890	8,471
Basic slag	295,097	12,748	173,081	6,623
Superphosphates	74,972	5,254	51,341	2,740
Nitrogenous fertilizer, n. e. s	308,982	66,236	170,011	37,090
All other	49,348	4,645	31,310	2,347
Total	2,813,371	348,486	2,106,501	236,281

New Products and Processes

Research Chemicals

The Eastman Kodak Company have added the following reagent and research chemicals, with the quantity on hand, order number, specifications and price:

100 g.	P-3234	Acridone MP 354-357° (Pract.)	$9.00
1 kg.	P-2523	o-Aminodiphenyl (Practical)	7.00
1 kg.	P-2524	p-Aminodiphenyl (Practical)	7.00
100 g.	2826	iso-Butyramide MP 123-124°	10.00
100 g.	3222	Ethyl Furoylacetate—BP 142-145°/20mm	10.00
10 g.	3149	p-Fluoroiodobenzene—BP 181-183°	2.50
1 kg.	P-3166	m-Hydroxydiphenyl (Pract.)—MP 76-77°.	6.60
100 g.	2864	m-Iodobenzoic Acid—MP 185-187°	10.00
10 g.	3162	1-Methyl-2-pyridone—BP 250-252°	5.00
100 g.	P-3224	b-Phenoxy-b′-chloroethyl Ether (Practical) BP 138-143°/8mm	5.00
100 g.	3210	Phenyl n-Butyl Ketone— BP 136-138°/12mm	5.00
10 g.	3240	Phenylmercuric Nitrate	2.50
100 g.	3242	Phenylpropionitrile—BP 161-164°/60mm.	11.00
100 g.	3233	iso-Phthalic Acid MP 312-314°	10.00
100 g.	3170	Propylenediamine 70-75%	3.50
10 g.	3184	Pyromellitic Acid MP 269-271°	2.60
10 g.	3023	Sodium m-Diphenylbenzidine—sulfonate.	2.00
10 g.	2886	Sodium p-Diphenylbenzidine sulfonate	2.00
100 g.	3227	Tetrahydrofurfuryl Salicylate— BP 131-133°/2mm	8.00
100 g.	3200	2.4.2′.4′-Tetranitrodiphenyl—MP 164-165°	10.00

New Resinous Plasticizer

A new resinous plasticizer is being marketed by the Hercules Powder Company under the name of Abalyn whose properties indicate use in the manufacture of clear lacquers for metals, wood, leather, coatings for paper and fabric, non-drying inks, rubber cements and other adhesives, waterproofing compositions, etc.

Abalyn is a pale yellow viscous resin that has a solvent action on nitrocellulose in the presence of alcohols. It is not appreciably affected by alkalies or weak acids and does not hydrolyze with boiling water. It has a faint, mild and ester-like odor, it is compatible with all the normal non-volatile and volatile ingredients of nitrocellulose lacquers, and is insoluble in water hence an excellent waterproofing and impregnating agent. It is a substantially non-drying product although it oxidizes very slowly to a pale yellow resin. It has a solvent action on practically all natural and synthetic resins, rubber, and drying oils. It is not corrosive and does not liver with basic pigments. It serves as both resin and plasticizer and may be used to impart gloss, adhesion and body in nitrocellulose lacquers, that normally contain no resins, without loss of flexibility.

Metals and Alloys

Chromates or chromic acid are a patented feature of a new German wood preservative in which their effect in fixing arsenic in wood is utilized. It is claimed the new preservative does not act on iron or steel and lends itself to subsequent painting or lacquering besides reducing the inflammability.

A British process has been perfected for the production of films of selenium on several light magnesium alloys. These films which confer considerable resistance to the corrosive action of sea-water spray, are normally produced by immersion for a few minutes in a bath containing 10 per cent of selenious acid in water at laboratory temperature, but may also be produced by rubbing the alloy with porous material dipped in the bath. The film has the property of self-healing to a limited extent, especially when immersed in stagnant sea-water. The film is only a few thousandths of a millimetre thick, and its production does not cause any appreciable dimensional change in the alloys treated and it forms a satisfactory base for certain types of paint. The special object of the research, which was the subject of a recent paper to the Institute of Metals was to find a process for the protection of magnesium alloys, used in aircraft construction, against corrosion by the atmosphere and chloride solutions, especially sea-water spray.

Ceramics

"Sinterkorund" is the trade name of a new ceramic product recently developed by Siemens and Halske. The product is obtained by sintering pure aluminum oxide to a completely opaque crystalline body at about 1,800° C. The material resembles porcelain, but its specific resistance at 400° C. is stated to be 100,000 times that of porcelain, whilst at 700° its specific resistance is 100 times that of fused quartz. Sinterkorund is expected to find application as an insulating material for spark plugs, particularly for airplane motors, and also as a constructional material for chemical plant, as it is completely resistant to hydrofluoric acid, fused alkalies, etc. Its hardness is 9 on the Mohs scale.

Details of the eradication of silicosis in the pottery industry were given recently to the Ceramic Society (England). Bernard Moore found that flint mixed under favorable conditions with the bone-ash—which constitute about 50 per cent of the English china body—caused some of the latter to decompose. This fact prompted him to search for a material which did not decompose, with the result that he found that promising results were obtained by the substitution of 75 per cent of calcined bone and 25 per cent calcined alumina for flint. His experiments proved that bone china placed in this material withstood extra firing without decomposing, and in addition, that there was a marked improvement in the colour of the china.—*Chemical Age.*

Rubber

Snow-white, transparent, non-flammable chlorinated rubber is on the market in Germany where it is finding use particularly for painting iron, concrete, and wood. These are no more expensive than the usual good paints and have better adhesive qualities. The Mannesmannwerke now produces about 10,000 kilos per month of a similar product known as "Tornesit" used for painting gas and water piping. Tornesit, containing 30% rubber, can be used for all articles hitherto made of ebonite or bakelite and may be obtained in all colors desired.

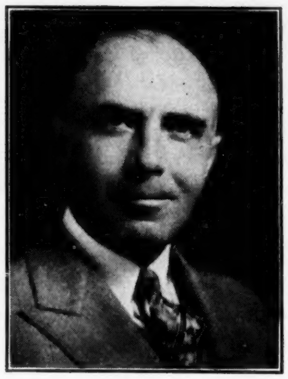
Decomposition of chlorinated rubber begins at 150°C.; therefore it is suitable for impregnating fabrics, wood, etc. It is resistant to acids and alkalies, insulates against electricity, and gives special hardness to films. It has specific gravity 1.5, is soluble in benzol, in esters and chlorin-hydrocarbons as well as in tetraline. It is insoluble in alcohols, benzine, and mineral oils. Highly concentrated solutions readily absorb colors and, therefore, have good covering power. Plastic masses, artificial leather, etc., can be produced from chlorinated rubber. The products are cheap because the basic materials, rubber and chlorine, are at present low in price and available in practically unlimited quantity; while production is comparatively simple and inexpensive. Moreover there is an increase in weight of more than 200% calculated on the basic rubber whereas in making hard rubber the increase is only 100%.

Chemical Distribution Problems

Tomorrow's big problem for the chemical executive will be the high cost of distribution. It is the common problem of many industries and trades, for not only have the expenses of handling, shipping, and selling all been mounting steadily since 'way back in the Gay Nineties; but they have not yet, as Mr. Derby points out in the following article, proved as amenable to reduction as the costs of production. Plant costs have been boiled down by our chemical producers, who recognizing keenly the absolute necessity of bringing chemical prices in line with the lower raw materials price level, are brought face to face with the knotty problem of now reducing distribution costs. Following are a series of four articles which tackle courageously the questions involved in the local distribution of chemical wares to the smaller buyers through the medium of the distributor or sales agent. It is CHEMICAL MARKETS' first contribution to an intensive study of our chemical distribution problem.

Logical Cooperation

Between Producer and Distributor



By Harry L. Derby
Vice-President, American Cyanamid Co.

BUSINESS today is in a precarious position. This is true of every line, every industry: it is true of our chemical industry, of our chemical producers and our chemical distributors. We shall come through; but how we come through depends upon us.

The industries that flounder through and emerge crippled are those industries that are not well managed by the men responsible for organization and administration. By that management I mean not only the chief executives of our big manufacturing companies, I mean also every plant manager, every sales manager, every credit manager, every branch office manager, and I mean, in the case of the chemical industry, every local chemical distributor who sells chemicals for a producer. How we come through this depression depends upon the efficiency of our management and that responsibility belongs to every man in the industry in an executive position.

So far the chemical industry has come through splendidly: better in the main than most of the industries of the country. We have been battling for a high and definite purpose, since as makers and sellers of chemicals, we are defending the industries of the American nation.

But we are face to face with grave problems. One of the most serious is how to bring down the cost of chemicals, for they must be brought down in line with the reductions in the costs of all basic commodities. The manufacturers are wrestling with the problem of lowering their costs of production in spite of a lowered volume. But when we look at the costs of almost every commodity, we find that the smallest reduction has been in the costs of distribution. This is certainly true of chemicals. There is something radically wrong with such a situation.

Upon the distributor of chemicals falls the responsibility of determining the right way of reducing distributing costs.

His business provides certain, definite, fixed charges for storing, handling, selling, and delivering chemicals. Those charges are a part of the chemical selling price. Distributors handling the same goods in the same territory are competitors, but they are also competing for their producers, and if one is inefficient, if one has costs that are too high, the whole industry suffers. I can assure you that the chemical industry cannot today tolerate inefficiency or too high costs anywhere.

If the distributor realizes this, if he feels that he is truly a part of the manufacturers' organization, then he will set to work to so cut his costs and so improve his service that he becomes absolutely indispensable to the concerns he represents. That is the sane, and that is certainly the safe policy. My advice to a distributor would be that he first know the chemicals he is trying to sell and that second he know the policies of the principals he sells for. Without knowing goods and policies, there is sure to be crossing of the wires. Troubles follow that no amount of local standing or selling ability will offset.

As I view it, logical and legal co-operation can go a long way these days, and it is my observation that the more I see of my competitors, as I meet them at conventions, in our offices, on the golf links, the more I come to believe that they are good fellows too. All the fine, honest men are not in our own organization. That is quite a big difference from the old days when one competitor would not even recognize the other.

So let us get together for logical co-operation. Exchange of ideas is stimulating. Exchange of opinions is of greatest value. Exchange of data on warehousing, salesmanship, and trucking would be a very important step forward to a more efficient and economical distribution of chemicals. I do not advocate a discussion of prices between competitors. It is not at all necessary. There are plenty of other useful and interesting things to talk about.

I am a bull on America. I even go so far that I still believe Congress will do something to help bring us through the depression. What it will be I do not know, and I do not know what they will do with the tariff. But I am certain that running at reduced speed it will require a long period before 1929 will come back. Let us deal with the situation of today. The chemical executive is sensible who says, "Next year may be worse, so let us organize to lower costs and combat competition." Who of us thought last year that this year we would look back at 1931 and think that it was a pretty good little year after all?

Get sensible management. Get your share of the profits. But be assured that nobody will get more share than he contributes to the common cause.

Facts First: Theories Later

By George Stanley Robins

President, G. S. Robins & Co.

OUR great American chemical industry has three well organized societies. The American Chemical Society, the Institute of Chemical Engineers, and the American Electrochemical Society, wherein the achievements in scientific research in practically all branches of chemistry are admirably studied and recorded for the benefits of present and future generations. Much of the advancement of the chemical industry has been due to the knowledge brought forth and disseminated by the cooperation of the members of these organizations.

The distributor, who is a specialist in chemical sales, should collect the facts and compile the practical experience as his contribution to the solution of the industry's distributing problems.

But when it comes to marketing the products of chemical knowledge, there is no such organization which has available any studied facts as to the many problems attendant upon converting chemicals into the all necessary dollar, or, in making them available for the service of industry and humanity. When one considers that sulfuric acid is worth from one-half to three-quarters of a cent per pound in tank cars, and from one and one-half to three cents per pound in carboys, simply according to the ideas of various distributors as to the costs of delivering that acid to the ultimate consumer, one then realizes the need for some tangible facts to serve as a guide in distribution. Certainly there should not be a difference of one hundred per cent in the ideas of marketing carboy acid!

The lack of information on distribution has no doubt been due to the widely separated fields of chemical consumption. The acid manufacturer does not make caustic soda, and the silicate of soda producer does not produce carbon tetrachloride. However there is not a great deal of difference in the handling, selling, delivering of one hundred drums of silicate or one hundred drums of carbon tetrachloride to one hundred different consumers. Wide differences do of course exist between the distribution problems surrounding ten dollars worth of vanillin, or the same value of sodium silicate, or the same value of codeine sulfate. Such differences, naturally, require that the study of chemical distribution be carried on in groups or divisions. But whether the commodity be a dyestuff, a heavy acid, a narcotic, or an aromatic, the manufacturer of it should have some source of knowledge other than that of his own where he can study the marketing possibilities, costs, and all the complicated problems of distribution that surround his product.

Market upsets, which have ruined many a chemical manufacturer financially, are usually traceable to a disregard of the economic laws governing the marketing of any commodity. Very often such laws are disregarded through ignorance or lack of sound judgment. Why can we not eliminate lost motion and economic waste by providing the knowledge of prevention?

The chemical distributor, who handles for the most part all categories of chemicals, appreciates the similarity in the problems of their distribution and through his perspective can see wherein many manufacturers are "all at sea" in their methods of reaching the consumer. Usually these floundering producers only stir up the waves, although they sometimes swamp others in the maelstrom of their ignorance.

It is logical therefore, that the chemical distributors should be the first to seek out the facts that will provide some definite procedure in the marketing of chemicals. The manufacturer is concerned with production as well as distribution: the distributor has only the problems of distribution. Why should not the distributor be the leader in the study of the subject with which he should be most familiar, in which he is a specialist? We are important factors in an industry created by a noble and worthy profession. Let us do all in our power to further the accomplishments of chemists and the chemical in industry.

A Distributor Looks at Distribution

By A. A. Harrison

President, Borden & Remington Co.

SEVERAL weeks ago I attended a salesmen's meeting held by one of the leading manufacturers of this country. At the close of the conference one of the officials of the company said to me: "A corps of efficiency engineers are going through our plant, department by department, seeking economies in cost of production. Their work has been highly satisfactory, for the net results have brought about economies ranging from 20 to 40% in the plant cost of the finished product. I am not at all sure that these engineers, if turned loose among our agents and our own branch offices and warehouses, could not bring about material savings in the cost of distribution."

This statement set me to thinking. I wonder just where my organization would stand if it were subjected to a searching inquiry by the group of engineers referred to.

I am well aware that the same methods could not be applied to a selling organization as in manufacturing plants, but I am equally sure that plans might be suggested, which, if carried out, would result in reforms of first importance in the sale and distribution of things chemical.

We have witnessed the growth of the chain store movement as applied to groceries, textiles, drugs, etc., and you and I know that it has been in the minds of some of the manufacturers of things chemical to investigate the possibilities of handling heavy chemicals in this manner.

Should this movement interest the chemical producer — what is to be our attitude? Are we going to cooperate with or antagonize the movement?

Have we any facts in hand that would indicate that the present cost to the manufacturer of his own branch office and warehouse is no greater than is now had through our own channels?

Let us suppose that the manufacturers are determined to carry out their own plans—what have we to offer to meet the new situation? Do you know that your costs are in line with the most efficient distributor?

I, for one, am convinced that the better grade distributor the distributor who conducts his business in a businesslike manner, occupies a useful field and is indispensable to both producer and consumer. I am also convinced that only those who can prove this fact will retain their identity in the future.

Quite recently there has been brought to my attention a plan that I am told is working successfully with the lumber dealers and distributors. This plan calls for the establishment of a central yard financed by the dealers in the district that is to be served. I am told that it is in successful operation in various parts of the country at the present time. The net results mean a reduced inventory for the account of each subscriber, more intelligent purchasing on a better basis for the account of the whole. The gains to the consumer are obvious.

This is but one of the plans for distribution that should be investigated.

Pondering these problems, I recall another conversation that I had a few months ago with a leader in one of our basic industries. This man had purchased a number of plants for merger, and I was trying to interest him in a plant of which I was then a director. He said he had no interest in buying further plants: "If I had this job to do over again I would start from an entirely different basis. Instead of trying to bring together a number of manufacturing units that may always be bought, I would first try to bring together the best selling organizations handling what the plants I now have manufacture."

Said he: "There is capacity for over-production of practically every commodity you might name, and the problem today is sales and distribution."

You and I know that this statement applies with no little force to the chemical industry.

Under the law of "the survival of the fittest," the weak plants must go. There is room for the strong units only. The same reasoning argues that the weak selling units must some day pass out of the picture.

During my forty-four years of contact with chemical distribution, I have witnessed many changes. Products formerly used are now abandoned. New methods and new chemicals are constantly appearing, and only the alert distributor, performing a real service for the account of manufacturer and consumer, may hope to remain in the field during the years to come. Someone has aptly said that "You must run like Hell today to stand still!"

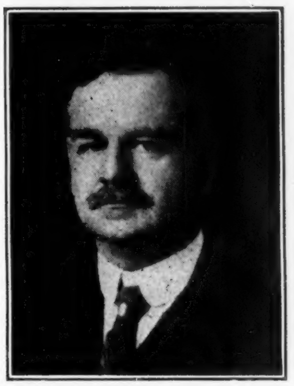
The distributor who conducts his business in a businesslike manner, occupies a useful field and is indispensable. Only those who can prove this will retain their identity.

What *ARE* Chemical Distribution Costs?

By Curtis R. Burnett

Vice-President, American Oil & Supply Co.

Has distribution kept pace with production in efficiency or in cost? One of the best known local distributors in the Metropolitan area answers an emphatic "No"— and points out some of the whys and wherefores.



MANY persons and firms today, not a few of whom are in the chemical business, are placidly pursuing their way, oblivious of changing conditions, doing business as they have in the past. They are in for a shock and a sad awakening some of these fine days.

Someone has truly said: "the only difference between a grave and a rut is the depth."

What has the chemical manufacturer done during the last decade? Improved his processes, replaced obsolete machinery with new and modern equipment, and by an intensive study of his problems, lowered the cost of production and raised, in many instances, the quality of his product.

What has the chemical distributor done during the last decade? I fear very little of a constructive nature, although he has been faced with a constantly growing expense in securing orders, making deliveries, and collecting his moneys.

Whenever the manufacturer has found it possible by his savings to pass a part of them along to the distributor, the latter, owing to the methods employed has been unable in many instances to benefit therefrom or to pass, in turn, a part of them along to the consumer.

There is something fundamentally wrong in this, and the depression checked efforts on the part of some manufacturers, looking to the formation of a chain of chemical supply houses, and on the part of others to make their sales direct, ignoring the distributor. Improved business conditions will likely see a resumption of these efforts and it behooves distributors, to protect our invested capital and place ourselves beyond vulnerable attack, or some of us may awaken too late and find ourselves headed, at a rapid pace, toward the door on which hangs a red light and the easily read sign "EXIT."

We have had our warnings, let us seek ways and means to remedy conditions.

The jobber is here to stay, a necessary link in the marketing chain; but I predict that only the distributor who diligently seeks to modernize his methods and thereby attract and hold the interest and attention of the producer will retain his place in the sun.

What are some of the distributor's problems?

Take the Sales Manager, a very essential official. How does he know how others in similar positions are getting the best results. As far as I know there is not a Sales Manager's organization in the country. We have everything else—Traffic Clubs, Purchasing, Credit, Advertising Associations, Clearing Houses for ideas and methods.

Does he know how other houses in lines similar to his compensate their salesmen—either by salaries, bonuses, profit sharing, etc.? How the very troublesome item of compensation for use of automobiles by salesmen is controlled? What is a reasonable allowance for traveling expenses, and what items are legitimate as expenses? How may he know what aids to business are employed by others?

Then, too, what medium is at my disposal to meet sales executives from other cities. I cannot compare notes as to costs, margins of profit, adoption of new lines and dozens of essentials that it is necessary for me to have in order to get the most out of business. These men are not competitors of mine, they should be friends, bound together by a community of interest.

The question might truly be asked—What has the producer done to assist the distributor to become more efficient? I cannot speak for others, but I do

know that of the dozen representative manufacturers that my house carries the agency for, most of them have not seen fit to send an executive officer to visit us, go over our plant, offer a constructive criticism or make suggestions that might be mutually helpful. The most we get is a host of field men who accompany our salesmen, taking their time that is needed for other purposes and getting little if any additional business for either of us.

Weakness exists on both sides, and there is no time like the present to make searching inquiries, and by the adoption of broad and far reaching policies on the part of both, producer and distributor, pave the way for better days, less headaches, and more satisfactory profits.

This is not the time or place for detail weaknesses, but it is no secret that we are all carrying products that sold at competitive prices mean an absolute loss. This cannot be remedied unless the wholehearted cooperation of the producer can be secured. United efforts by houses in non-competitive fields might correct these faults, and remove the present penalty of resting the burden upon products that enable us to secure a wider margin of profit, and this, too, is unfair to those who are trying to help the distributor.

Goods that have to be stocked, delivered by truck, and sold on credit with the attendant risk and showing a gross profit of 5, 6 or 7% have no place in our program, and trade abuses that have brought about such a condition should be speedily remedied. Even the producer himself will admit that he cannot place the goods in the consumer's hands direct without a much greater cost than I have named.

Let us, therefore, address ourselves to the task of perfecting an organization that will, at the same time, assure worthy distributors a reward commensurate with their effort, and place in the hands of the producer highly efficient machinery so that his products may reach their final destination in good order, in good time and in good repute.

Equipment Bulletins

Paul O. Abbe, Inc., Little Falls, N. J. A new addition of 120 illustrated pages describing the Abbe ball and pebble mills and mixers.

Dorr Co., 247 Park Ave., N. Y. City. A valuable leaflet—a table of conversion factors for engineers. Available by writing the Dorr Co.

International Nickel, 67 Wall St., N. Y. City. Bulletin T3 Sulfuric Acid vs. Metals; TS 1, The Resistance of Pure Nickel and Inco Chrome Steel to Corrosion by Milk.

Littleford Bros., 447 E. Pearl St., Cincinnati. A profusely illustrated booklet describing the Littleford Line of tanks.

Raymond Bros. Impact Pulverizer Co., 1302 N. Branch St., Chicago. A new leaflet describing a complete plant for drying and pulverizing.

Union Carbide & Carbon Corp., Union Carbide and Carbon Bldg., N. Y. City. A leaflet showing in a popular way Electromet-ferro-alloys and metals many uses.

Universal Vibrating Screen Co., Racine, Wis. Catalog 99—a profusely illustrated 32-page booklet showing the various types of screens manufactured.

Chemical Construction

Canadian Carborundum Co., Niagara Falls, Ont., has awarded a contract for the construction of an addition to its plant which with machinery will involve an expenditure of $250,000, in-increasing the total investment to $2,750,000.

Canadian Industries, Ltd., Montreal, is engaged in designing commercial plant to be built at Copper Cliff, Ont., to produce sodium and aluminum sulfates. These chemicals are to be recovered from waste slag by a new process developed by Canadian Industries.

Company Booklets

American Cyanamid, 535 5th Ave., N. Y. City. "Cyanamid in the Fertilizer Industry". A 24 page booklet describing the advantages of cyanamid under various conditions. Contains valuable figures for the fertilizer mixing industry.

Binney & Smith, 41E. 42nd St., N. Y. City. A leaflet on Metalex, the newest member of the Binney and Smith soapstone and talc crayon line.

Birmingham Industrial Board, Birmingham. "A Chemical Survey of the Birmingham District" prepared by Dr. Stewart J. Lloyd, Dean of the School of Chemistry, University of Alabama. A very important contribution to the study of geographical location of chemical manufacture and the natural resources of the district from the chemical manufacturer's viewpoint.

Commercial Solvents, Peoria, Ill. or 230 Park Ave., N. Y. City. New booklet describes butanol and other products of the company. Contains valuable information for the user of solvents.

Du Pont, Wilmington, Industrial Finishes Division. The story of Duco household cement. Uses are by no means limited to the household, for example, in the commercial laboratory.

Eastman Kodak, Rochester. April number of "Synthetic Organic Chemicals" features a short article on diazonium compounds and their use in organic synthesis.

Givaudan-Delawanna, 80 5th Ave., N. Y. City. An attractive booklet describing the complete Givaudan-Delawanna line together with current prices.

Faure, Blattman & Co., Holland House, Bury St., London, E. C. 3, England. "Review of the Oils and Fats Markets in 1931. The accuracy and value of this annual compilation is so well known as to need no comment other than that it is completed.

Grasselli Chemical, Cleveland. Leaflet describes Manganar Rose Dust a superior dusting material for rose bushes.

Heyden Chemical, 50 Union Square, N. Y. City. The April price-list.

Hercules Powder, Wilmington. "The Hercules Mixer"—continues outstanding in the field of company magazines.

Mallinckrodt Chemical, St. Louis. April price list.

Merck & Co., Rahway, N. J. "Merck's Report" contains complete prices and several important articles for the consuming trade.

Philadelphia Quartz, Philadelphia. Describes the use of Metso sodium metasilicate in the process of de-inking paper.

Roessler & Hasslacher Chemical, Empire State Bldg., N. Y. City. R & H has just issued several booklets of special interest. (1) "Artic, The Ideal Refrigerant." (2) "Control of the Cranberry Root Grub with Cyanegg." (3) R & H Peroxygen Compounds. (4) "A few Popular uses of R & H Sodium Perborate."

Sheldon, Morse, Hutchins and Easton, Graybar Bldg., N. Y. City. Describes the services offered by this group of marketing experts.

Carbide and Carbon Chemicals, Carbide and Carbon Bldg., N. Y. City. "Emulsions." A very complete and authoritative 55 page booklet describing the preparation of emulsions using several of the Carbide's synthetic products but principally triethanolamine. Contains a fund of information on actual compounding of many industrial and household products.

Chemical Facts and Figures

General Chemical's Suit Against Selden—Unemployment Committee Seeks Funds—International Combustion Tar and Chemical Sold—Swann Sales Expansion—Whitaker Elected Vice President of Cyanamid—Lammot duPont Attacks Government Expenses

Decision is expected next week in the suit of General Chemical against Selden Co., (American Cyanamid subsidiary) claiming infringement of the Slama-Wolf patent for the use of vanadium catalysts in contact sulfuric acid manufacture. The litigation has attracted wide interest both here and abroad.

The Slama-Wolf patents were filed by the Badische Co., in this country in 1914 and an agreement made with General Chemical granting exclusive rights in the United States. Patent No. 1,371,004 was issued in 1921. The Slama-Wolf patent was a modification of the 30 year old deHaen patent.

Patents Involved

Shortly after the close of the World War Alfonse Jaeger, a chemist formerly in the employ of the Badische Co., came to this country and became associated with the Monsanto research division. While in their employ he was engaged in further work on the use of vanadium catalysts and obtained a patent. Subsequently he left Monsanto's employ and went with the Selden Co. Again he was successful in obtaining further patents. Monsanto filed suit, alleging Jaeger's violation of an employment contract. In a decision made in March 1929, the District Court of Western Pennsylvania held that Monsanto was only entitled to licenses under Patent No. 1,657,754 and applications on such related product inventions as were in existance when the contract was signed. The Court held that after Jaeger's resignation he was in no way obligated to the company, and therefore Monsanto had no rights under patents No. 1,675,308 and No. 1,675,309. At the same time the suit of the Barrett Co., against Selden over patent No. 1,604,739 on an "apparatus for promoting catalytic reaction," granted Oct. 26, 1926, to Charles R. Downs was decided in favor of the plaintiff. Court held that "the evidence shows that the defendent's converter in use at the institution of this action is exactly covered by the claims of the Downs patent."

General Chemical entered suit against Selden in August, 1929 for an alleged infringement of patent No. 1,371,004 just about the time the Selden Co., was taken over by Cyanamid interests. Trial of this suit came before Judge McVickers sitting in the West Pennsylvania Court, Pittsburg, Pa., on April 11 and continued until April 22. Technical experts appearing for General Chemical were Dr. C. R. Downs, J. A. Singmaster, Dr. Scharff of Germany, for years in the employ of the Badische interests, Henry F. Merriam, and A. C. Shinn. Appearing for Selden were Dr. Wm. M. Grovesnor, Roy M. Allen, Prof. J. S. Long, S. F. Spangler, A. E. Wells, C. J. Schwindt, C. B. Clark, and Robert Pfanstiehl.

Defense set up the claims that the Slama-Wolf patent is non-valid due to incomplete disclosure of the essential facts, and further, that the present patents of the Selden Co., are not an infringement of the Badische patent.

Briefs Filed

After hearing the involved testimony Judge McVickers ordered the litigants to file briefs not later than May 16, and his decision is expected to follow promptly.

Selden has advised all licenses that they will be provided with a non-infringing catalyst should the decision be unfavorable to their defense. Such a decision would open up the possibility of a similar suit by General Chemical against Monsanto.

Unemployment Relief

Committee on Unemployment and Relief for Chemists and Chemical Engineers sponsered by ten leading technical societies (local sections) and business associations of the industry and assisted by a committee of outstanding leaders, is appealing for funds to relieve the dire want of a large number of men who through no fault of their own find it impossible to secure employment under present conditions.

Frank G. Breyer, executive chairman in appealing for contributions said:

"More than one hundred members of our profession in the metropolitan district are in want. Their families are approaching despair. Fifteen hundred more are out of employment. Some have been unemployed for over a year.

"Professional fellowship and human sympathy demand that the more fortunate of us contribute to the immediate relief of the destitute in our profession. Public relief funds administered by the Gibson and Bliss Committees are running low. They are inadequate to meet the general situation and can no longer be counted upon to take care even of the most desperate cases.

"This committee has been organized by the local sections of all the important national chemical and chemical engineering societies. Administrative costs will be paid from funds given specially for this purpose. Contributions will be applied directly, immediately and sensibly to the relief of chemists and chemical engineers.

Needed—$15,000

"We feel the best temporary solution is to finance the work of the Committee on Unemployment and Relief for the period April 25th to July 1st. Fifteen thousand dollars is required. An average of $5.00 per month for two months from 1,250 men will give $12,500. We can get $2,500 from other sources.

"The need is immediate and urgent. Unless we who are more fortunate respond generously many members of our profession face real want, demoralization and tragedy."

Checks may be made payable to R. T. Baldwin, treasurer.

Reilly Buys Int. Comb.

International Combustion Tar & Chemical creditors deposited their claims in favor of the sale of the properties to P. C. Reilly of Indianapolis.

Under arrangements made the International Combustion Tar & Chemical properties were to be transferred to Mr. Reilly on or before May 1, and thus the first definite steps in the reorganization of the complex setup will be completed. Sale of the property for cash will provide sufficient money to pay off approximately $1,200,000 of the amount borrowed by the receivers against their receivers' certificates.

International Combustion, Tar & Chemical Corp. was acquired by International Combustion Engineering Corp. in 1927. At that time it was known as the F. J. Lewis Manufacturing Co. It owns or controls tar distilling plants in Newark, Chicago, Granite City, Ill., Fairmont, W. Va., and Chattanooga, Tenn.

Imported products which contain methanol are dutiable as alcoholic compounds, according to a ruling of the Commissioner of Customs, issued as T. D. 45528.

Washington

Muscle Shoals was scheduled to move once more out of the Committee of Military Defense and on to the floor of the House. The debate scheduled to start May 5th is expected to be filled with fireworks. The Committee has reported the Hill Bill (H. R. 11051) which opponents claim is essentially the same as was introduced last year. The Senate Committee has reported out the Norris Bill. It is reported that there is a strong possibility that the Hill Bill may be enacted by a two-thirds majority. There is little question but what the Senate will pass the Norris measure. The next step is that of a conference report from a House and Senate Committee. Whether the President will feel obliged to veto Muscle Shoals legislation in the face of a two-thirds majority in both houses is problematical, and the opposition is hopeful of holding the vote in the House on the Hill Bill and in the Senate on the Norris Bill to as small a majority as possible in order to further insure the President's veto.

Coal Regulation

Coal besides being a chemical raw material is also one of the largest items of expense in many chemical manufacturing operations. Therefore the proposed establishment of a bituminous coal commission contained in the Davis-Kelly Bill (S.2935) giving plenary and arbitrary powers is of vital importance. A few of the provisions indicate the intent of the proponents of the measure. It can prescribe facilities which the licensee must have and use in the preparation of coal for the market, it can prescribe the operation of mining communities, it can regulate and generally supervise all company stores maintained by mining companies, it can provide that labor must be paid weekly or monthly, it can demand a measure of credit be extended to employees, it can prevent in the case of a strike the employer from dispossessing the employee for a stated period, it can prevent the licensee from interfering with representatives of the union conferring with employees, and prevent employees from being discharged for joining the union. In addition, it will give to the commission almost unlimited control over the marketing of coal and the fixing of prices.

Sulfate Hearings

Domestic sulfate of ammonia producers were heard April 11 by Assistant Secretary of the Treasury Lowman on the question of "dumping" of sulfate in this country by foreign producers. He has not as yet announced a date for the opposition to appear in Washington and it may be several weeks before a decision is reached. Meanwhile, sulfate imports continue to how large increases in tonnages over the same period a year ago.

COMING EVENTS

American Electroplaters' Society, 20th Annual Convention, Benjamin Franklin, Philadelphia, June 20-23.

American Gas Association, Atlantic City, June 3-4.

American Institute of Chemical Engineers, spring meeting, Schenectady and Corning, N. Y., June 15-17.

American Leather Chemist's Association, Atlantic City, May 25-27.

American Society for Testing Materials, Annual meeting, Atlantic City, June 20-24.

Insecticide and Disinfectant Mfrs. Association, mid-year meeting, Chicago, May 23-24.

Economy Measures

In response to insistent demands from every section of the country, President Hoover offered a definite program of economy designed to effect a total saving of about $250,000,000 in the coming fiscal year. The President's three point program called for a reduction of federal salaries, elimination of automatic increases, reduction in personnel, a staggered furlough plan for employees, elimination of vacation allowances, consolidation and reclassification of many departments and bureaus, permission for the Bureau of Mines and Bureau of Standards to charge fees for services, and the relinquishing of experimental stations to such states as will agree to assume responsibility for their maintenance. These proposals were incorporated into a bill submitted to the House. The proposal to consolidate the War and Navy Departments into one Department of National Defense was not introduced into the bill with the President's consent, and he is said to be unalterably opposed to this feature. The House Committee in preparing the bill also added a provision calling for the creation of a department of Public Works and this too is said to meet with the President's disapproval. As the month closed the fate of the measure was in doubt. In the first two days of debate over $64,000,000 was slashed from the estimated savings.

"Volatile Poison" Bill

The Manufacturing Chemists' Association has forwarded a statement to the Committee of Agriculture and Forestry, of the Senate listing several important objections to the proposed Bingham "Anti-Poison" Bill (S. 3853). It points out the following inconsistencies in the Bill which would work a tremendous hardship on chemical manufacturers effected:

1. It lists a large number of chemical products which do not enter the household; (2) It lists many products which are already labeled "poison" under existing statutes; (3) It includes products which already carry the poison label or precautionary warnings by voluntary adoption of the manufacturer; (4) It requires a poison label on products concerning which there is no evidence of toxicity; (5) It requires a poison label on thousands of chemical products, when and if introduced into the household, without consideration of their properties. In this respect it involves a conviction before trial; (6) The practical effect on this Bill would be a mandatory requirement for a poison label on certain household articles, such as automobile polishes, floor polishes, paper, composition shingles, moth repellents, non-inflammable and non-explosive cleaning preparations, and such common articles as insulated electrical wiring and fire extinguishers; (7) It would require an additional and separate Federal poison label on articles which already must carry a poison label under existing laws."

Federal Trade Commission recently made public its first report on its investigation of price bases, which is an inquiry into the methods of basing prices with respect to location. The purpose is to give help toward a solution of the problem of a greater economy in distribution. The current report is entitled "The Basing-Point Formula and Cement Prices."

The U. S. Tariff Commission on April 5th ordered an investigation of lithopone.

Lacquer Suits

Interest in the lacquer patents situation was revived during the past month when the Du Pont Co., issued a letter to its licensees reviewing the reasons for the delay in bringing the test suit against the Glidden Co., to trial. The letter is summarized:

"As a licensee under our lacquer patents license contract, we know you are vitally interested in early court action. It has been our desire from the beginning of the pending litigation against the Glidden Co., to have this suit tried just as promptly as possible and to have it followed promptly by trial of the Jones Dabney suit. The defense in the Glidden suit, however, has repeatedly asked for extensions of their time in which to take depositions, and these extensions have always been granted on the grounds that the taking of these depositions now will save considerable time during the trial itself."

"Much as we regret the delays which have occurred, we realize—and hope that you do—that they are unavoidable in a

proceeding of this nature. As pointed out above, however, they have been requested always by the defense and never by our attorneys.

"Since the Brooklyn Court does not sit during May, we can not get our case on the trial calendar before June, but are hopeful that it will come up during that month. Meanwhile, you may be sure we are doing everything we can to avoid any further delays. Much evidence of importance to both sides is being accumulated during this period of deposition taking so the preparation of the case has not suffered in any way."

Foreign Pulp

Currency depreciation in foreign countries has had no material effect on imports into the U. S. of wood pulp and pulp wood, although larger imports have been shown from some countries, according to a report to the Senate on April 21, by the Tariff Commission.

Setting Sept. 25 as the date of the beginning of currency depreciation abroad, the commission undertook a determination of imports from such countries in the succeeding six months and compared them with imports for the corresponding period preceding. Total imports of wood pulp from all countries during the six months following the beginning of currency depreciation to March, 1932, averaged 159, 913 tons monthly, as compared with 148, 978 tons from October, 1930, to March, 1931, an increase of 7 per cent.

Much of the increase was in unbleached sulfate. Such imports rose 38 per cent over the preceding year, and arrivals from Finland, an important factor in that form of wood pulp, increased 62 per cent. Imports of bleached sulfate dropped to 64 per cent of the total for the corresponding period a year earlier.

Imports of wood pulp from Canada during the six months from October, 1931, to March, 1932, were 38,531 tons, or only 83 per cent of the total for the preceding year's corresponding period.

Due to seasonal aspects of wood pulp imports, the commission said, there is considerable difficulty in determining the extent to which any increase might be due to foreign currency depreciation with resulting improved competitive position in the American market. The situation was said to be further complicated by the letting of European contracts for future delivery.

Importations

As to the effect on domestic pulp production of foreign competition, the report said:

"Although imports during recent years have been a much higher proportion of domestic consumption of wood pulp than before the World War or immediately after the war, there was little change between 1926 and 1931 in the ratio of imports to domestic consumption."

Corn Institute Dissolved

Judge Charles E. Woodward in the United States District Court, Chicago, ordered on April 7 that the Corn Derivatives Institute be dissolved within thirty days and enjoined the fifteen defendant members of the group from forming, participating in or contracting with any institute, bureau, association or similar organization carrying on similar practices. The decree was issued on petition filed April 6 by the U. S. Department of Justice, and at the same time the defendants consented to the entry of the decree.

News on Metals

Interesting news items on metals during the month included the announcement by General A. D. McRae of Vancouver that there is a strong possibility that the recently discovered pitchblend ores of the Great Bear Lake region of Western Canada may be nationalized; the discovery of mercury ("cinnibar") in Pike, Howard, and Clark counties of Arkansas; the announcement by the Dept. of Commerce that the experiments to concentrate the black ferroginous manganese ores of the Cayuna district in Minnesota were successful, and that it is now possible to utilize an ore which formerly was valueless because of a high silica content; the announcement of Copper Exporters, Inc., that an accord had been reached in the international trade situation and that the export group will operate under the old rules with production held to approximately 20 per cent capacity. Captain Oliver Lyttleton, Chairman of the British American Tin Corp., told a stockholders meeting in London that he believed that production of tin was now below consumption and that he did not expect the price to go any lower; finally O. W. Roskill of London, in an address before the American Zinc Institute, stated that production in 1931 was only about 20 per cent of 1929 with the U. S. producing about 48 per cent of that amount. He stated that the zinc industry was in better statistical position than either copper or lead.

Swann Expansion

Theodore Swann, president, Swann Corp., at a press conference held April 29th in his exquisitely appointed suite of offices in the Graybar Building in N. Y. City told of his plans for expansion into territories heretofore not covered by Swann salesmen.

Said Mr. Swann: "We are convinced that this is a favorable time to expand our business." In consequence, we are increasing our sales forces by more than fifty per cent, and, in addition to our present offices in Birmingham, St. Louis, Cincinnati and New York, we are opening new offices in Boston, Baltimore, Pittsburgh, Charlotte and Dallas. We are also placing sales representatives in Albany, Harrisburg, Camden, Cleveland, Louisville, Knoxville, Memphis, Atlanta, Jacksonville, and New Orleans. The Baltimore and Charlotte offices are being opened immediately and all the other arrangements will be completed before the end of May.

"This move is not based upon mere guess work or hopes," continued Mr. Swann, "but upon facts. Nine months ago we decided to secure more data than we possessed about our possible markets and so began a very thorough survey to determine the requirements of all kinds of chemical users. We sent representatives into various states and they made a complete canvass, calling upon every consumer of chemicals from the largest of industries to the smallest of automobile service stations.

"This work is still in progress, but the information that we have so far secured has enabled us to increase our business month by month and assures us of the soundness of an aggressive policy of expansion."

2nd Quarter Car Loadings

Chairman Harry F. Suiter of the Subcommittee on Chemicals and Explosives of the Atlantic Shippers' Advisory Board stated at the recent Newark meeting: "While we of the chemical industry are inclined to be optimistic as to freight car requirements for the second quarter of 1932, we cannot anticipate that any substantial increase will take place over the first quarter of 1932. We are hopeful of holding our own because the general feeling is that business conditions will become fairer in some cases. However, reports have reached us which state the opposite to be the case; while other reports indicate small percentages of increase. All in all, the car requirements for the second quarter of 1932 may, to a small degree, exceed those of the same quarter for 1931."

Nuisance!

Industrial plants in New Jersey are the cause of a dust, smoke, and gas nuisance in Staten Island according to a report by the Division of Sanitation of the N. Y. State Department of Health.

The report, it was announced by Dr. Thomas Parran Jr., Commissioner of Health, has been forwarded to Governor Roosevelt. It represents an investigation over a period of several months.

The report states that "offensive, irritating, poisonous or otherwise objectionable and injurious smoke, gas fumes and vapors" descend on Staten Island from some of the plants that were investigated.

The investigation as made at the direction of Governor Roosevelt following a presentment of the Richmond County Grand Jury late last Summer. Twenty-six plants in New Jersey and six on Staten Island were included in the survey including a large number of chemical, metallurgical and fertilizer plants.

American Cyanamid announced that after two years of experimenting arrangements have been completed to ship Cyanamid to the fertilizer trade in paper bags. Burlap bags will be used only where demanded by manufacturers or mixers.

Wiley & Co., stockholders elected J. Rich Holland as president, to succeed the late Dr. Samuel W. Wiley. S. W. Wiley, Jr., was elected vice-president.

Reynolds Fertilizer, Reynolds, Ga., formed to manufacture mixed fertilizers.

Philadelphia Quartz appointed Charles L. Read & Co., as distributors of silicates and metasilicate in New York City and the Metropolitan section.

Cleveland Cliffs is now producing activated charcoal with an operating schedule at present of two tons daily. Personnel at Cleveland Cliff's plant increased from 80 to 108 within the past month.

Atlantic Creosoting plant, Burtons Point, Va., damaged by fire.

New addresses reported: Church & Dwight to 70 Pine St., N. Y. City; Pylam Products to 799 Greenwich St., N. Y. City; Murray Oil Products (N. Y. local office) to 21 West St., N. Y. City; Paint Oil & Chemical Review to 537 S. Dearborn St., Chicago.

Irving Post Co., Savannah, applied for a charter to do a general naval stores business.

B. F. Goodrich Co., Akron, through Dr. Howard E. Fritz, chemical sales department, announced the commercial development of using protective sheathings of wood or brick in connection with the application of Triflex rubber adhered by the patented Vulcalock process. The new development affords structural strength and permanence not before attainable in pickling work.

Chlorine Institute, formerly located at 30 E. 42 St., is now located at 50 E. 41st St., N. Y. City.

Evans Chemical organized in Buffalo, N. Y., by Miller C. French and associates to operate a chemical products manufacturing business.

Stauffer Chemical moved its offices from Houston to Freeport, Texas, on April 1st. In addition, the company maintains offices in N. Y. City, Chicago, Los Angeles, San Francisco, and plants at Freeport, San Francisco, Berkeley, Bordeaux, France, and Vigo, Spain.

United Carbon held its first annual sales convention at Charleston on April 21.

Company News

Stephens-Adamson Mfg. Co., Aurora, Ill., has just completed a new vibrator screen with several new and novel improvements.

Empire State added another chemical tenant when Shawinigan Products signed a lease for most of the 13th floor.

Texas Potash Corp., of Dallas, has leased from O. J. Jones of Midland, Texas, the potash rights to his farm. It is claimed that 57,000,000 tons of workable material are in the tract.

Royce Chemical, Carlton Hill, N. J., manufacturer of textile chemicals, is now producing sodium hydrosulfite under the trade name of Vatrolite, on a commercial scale.

Ripplemead Lime Co., of Ripplemead, Va., granted charter to manufacture and sell lime.

Vanadium Alloys Steel absorbed its subsidiary, the Colonial Steel Co. All operations will be centralized at Latrobe, Philadelphia.

Atheline Chemical Co., Baltimore incorporated to deal in chemicals, and medicinals.

Du Pont Cellophane reduced prices of cellophane during the month approximately 8 per cent, varying with the grade. This announcement is coincident with the completion of added plant facilities at Buffalo.

Binney & Smith issued an appeal during the month to all of its customers for support in defeating the alleged infringement of their patents on yellow oxide.

Kron Co., formerly American Kron Scale Co., now located in Bridgeport, Conn., manufacturers of industrial scales, has just appointed George A. Nichols as its New York District Manager. Mr. Nichols will be located at 801 Chrysler Building.

Sholes, Inc., moved its offices and shops to Orange, N. J. New York office will be located at 50 Church St., N. Y. City and New York customers may obtain direct connection with the Orange offices by calling the New York telephone number.

Virginia-Carolina completed a plant at East St. Louis with capacity of 20 carloads daily.

New York Glycerine Co., Inc., organized at Bolivar, N. Y., to operate a plant for the manufacture of nitroglycerine and other glycerine products.

United Carbon joined the procession to the Empire State on April 15. The Company maintained offices formerly at 230 Park Ave., N. Y. City.

Orville Simpson Co., Cincinnati, appointed Cleveland Duplex Machinery, Inc., Penton Building, Cleveland, to represent their Company in the northeastern Ohio territory. Cleveland organization will handle sale and service of Simpson's Rotex Screeners.

Newport's Carrollsville plant added between 50 and 60 men to its working force during the past few weeks. Total payroll is now about 420 people. Plant operations are now between 80 per cent and 85 per cent of the 1930 figures and about 65 per cent of the 1929 totals.

Dorr Co., secured exclusive sales rights to the Turbo-Mixer and other Turbo equipment in certain of its principal fields. Henceforth, Dorr will offer agitators and mixers of both its own and Turbo-Mixer design.

Watts Chemical Co., Toronto has effected an arrangement with B. T. Babbitt, Inc., under which it will manufacture cleansing products of the latter firm. This will involve the construction of a new factory unit which will have a capacity sufficient not only to handle the output for Canada, but take care of possible export shipments to British Empire points as well. Building operations are already under way.

Latex Fiber Industries, Inc., new company owned jointly by the U. S. Rubber and J. P. Lewis Co., has been announced. Products now manufactured by the Fiber Products Division of U. S. Rubber, as well as a line of paper and paperboard specialties, will be produced by the new company at Beaver Falls, N. Y., in Lewis, Slocum & LeFevre Co., Inc., plant, ready for production June 1.

Eastern Melters' Association formed by 18 producers of tallow and greese opened offices in the N. Y. Produce Exchange. President is Morris F. Pick.

Atlas Powder as an emergency measure to meet the problems created by present business conditions, adopted, effective May 1, a five day working week for the entire salaried personnel, including wholly owned subsidiary companies. This change will be accomplished by the omission of all of Saturday as a working day, or in cases where this is not practicable, special arrangements will be made. Coincident with the above reduction in working time, a reduction of 10 per cent in present monthly salary of all employees and executives on the salary roll became effective May 1.

Bailey Meter, Cleveland, is introducing the Bailey Adjustable Orifice for fluid meter installations where it is desirable to obtain accurate measurements over a wide range of capacity. The company has prepared literature on the subject.

Personnel

William J. Robertson, formerly vice-president and general sales manager Heller & Merz, was elected president April 15. Mr. Robertson succeeds Eugene Merz, who was president of the Corporation since 1930. The change in the executive head, it was pointed out, does not mean the complete retirement of Mr. Merz from the activities of the business, as he will continue to serve in an advisory capacity.

William J. Robertson

Mr. Robertson started his career with Heller & Merz on March 15, 1895, and during the 37 years' affiliation with the Corporation, he devoted most of his attention to the development of the business from a sales angle. If one were to ask Mr. Robertson his business, he would immediately answer "selling goods." Prior to holding the office of vice-president he served for 10 years as sales manager and assistant to the treasurer.

Pitcher Viscoloid Head

Arnold E. Pitcher, for the past three years executive vice-president Du Pont Viscoloid was elected president of the corporation to succeed C. K. Davis who recently resigned to become president of R & H.

Arnold E. Pitcher

Mr. Pitcher goes to his new position after a service of 23 years which began with the old Arlington Co., manufacturers of Pyralin. That company was purchased in 1915 by du Pont interests and reorganized into what is now known as Du Pont Viscoloid. He entered the organization in January 1910 in the capacity of salesman to handle Pyralin products in their various forms in the states of Ohio and Indiana with headquarters at Cleveland. His service in that field brought him promotion and he was made district sales manager Chicago office. Later he was transferred to executive headquarters at Wilmington as assistant director of sales, when sales were handled from that city. After a service of two years in this capacity, he was made director of sales. He acted as director of sales for seven years, and in March 1929 was made vice-president of Du Pont Viscoloid. In June of that year he was appointed executive vice president, which position he has filled up to the time of his elevation to the presidency.

Whitaker a Director

Dr. M. C. Whitaker was elected a director and vice-president of Cyanamid on April 26. Dr. Whitaker has been intimately connected with chemical industry for nearly 35 years during which time he has risen to a position of outstanding leadership in both technical and business divisions of the industry.

After a long period in the teaching service of Columbia he became vice-president of U. S. I., a position he held for ten years. During the same period he was the editor of the Journal of Industrial and Engineering Chemistry. Dr. Whitaker received the Perkin medal in 1923. Resigning from the Alcohol company he entered private consulting work and in 1930 became identified with the Cyanamid interests. Dr. Whitaker is a member of the consulting board of editors of CHEMICAL MARKETS.

Dr. Mortimer J. Brown resigned April 1 as director and vice-president of R. & H., ending over 20 years service with that company. He was also director and vice-president of the Pacific R. & H. Chemical Corp., and director of the Niagara Electro Chemical. Dr. Brown is planning to enter into private consulting work.

Frederick J. Werner, formerly connected with N. Y. office, Spencer Kellogg Sales Corp., is now associated with G. A. Wherry & Co., broker in vegetable oils and naval stores, N. Y. City.

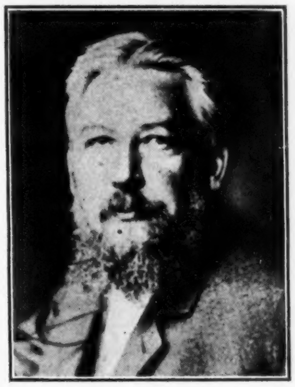
George L. Brown has been appointed executive vice president, J. T. Robertson Soap Co., Syracuse, N. Y. He was formerly associated with Stephen F. Whitman & Co., Philadelphia, as general sales manager.

H. D. Ruhm, engaged in publicity and research work for Ruhm Phosphate & Chemical, Chicago, resigned May 1.

Edwin F. Nunemacher, Jr., control chemist is now with the National Aniline at Buffalo. Mr. Nunemacher was formerly with Pratt & Letchworth Co.

Personal

Died. Wilhelm Ostwald, 78, 1909. Nobel chemical prize winner and the recognized founder of the modern science of physical chemistry. Prof. Ostwald was born Sept. 2, 1853 at Riga, Latvia. For nineteen years he held the professorship of the chair of chemistry at Leipzig and his laboratory became the mecca of a new group of scientists interested in the physical side of chemistry. He visited this country in 1905 as an exchange professor and lectured at Harvard and Columbia. He retired from the teaching profession in 1906 to devote his entire energy to research problems. Perhaps his most notable achievement was the discovery of a process for oxidizing ammonia to form nitrous oxides using a platinum catalyst. He was the author of a large number of scientific books and was co-founder of a German publication devoted to physical chemistry.



Selden Co. Founder

Died. James McCobb Selden, April 12, founder and until two years ago president of the Selden Co. Mr. Selden was born in N. Y. City, Oct. 12, 1863 and his early education was obtained in that city. He moved to Cincinnati while in his early twenties and entered the grocery business. In 1906 he went to Pittsburg to start a brokerage business and in 1917 founded the Selden Co. Despite several misfortunes including a disasterous plant fire the company expanded its operations until it became the largest producer of phthalic anhydride in the world. His company was also engaged in a large way in research work on vanadium catalysts for use in contact sulfuric acid manufacture. The Selden Co., was absorbed by the Cyanamid interests in 1929 and Mr. Selden remained as president but only for a short time. Ill health forced him to drop all active work in 1930. He remained a member of the Cyanamid board of directors.

Died. J. M. Rowland, chief engineer for Hooker Electrochemical on April 6. He was a graduate of Sheffield Scientific School. Shortly after he became connected with the Hooker Company in 1903

and rose gradually to the important position he held at his death. He was a member of the A.C.S., A.I.Ch.E., Chemists' Club N. Y., Yale Club, and other fraternal organizations.

Died. William N. Allen, 84, well-known fertilizer manufacturer of the Philadelphia area. His business and club affiliations included the Philadelphia Bourse, the Historical Society of Pennsylvania and the Franklin Institute. He is survived by his widow and a sister.

Died. Clement R. Wainright, 53, vice-president, Penn Chemical Works shot himself at his home in Salem, N. J., on April 10th.

Died. David Gulland, 59, superintendent of the Cyanamid plant at Linden, N. J. on April 20th. He was with American Cyanamid for the past 12 years in various technical capacities. He is survived by a widow, a son, and two daughters.

Died. Francis P. Smith, 64, noted highway engineer and chemist on April 20th. Mr. Smith was connected for many years with the N. Y. Board of Health. He later entered the employ of Consolidated Gas. For the past quarter of a century he devoted himself exclusively to paving problems and was connected with several companies in this field. He laid the first asphalt pavement in Germany.

George Eastman, in a codicil to his will signed and witnessed a few hours before he killed himself March 14, left the bulk of his $20,000,000 estate to the University of Rochester.

The share of the University of Rochester is valued at about $12,500,000, and the codicil revoked bequests to Cornell University, Massachusetts Institute of Technology and Young Women's Christian Association of Rochester.

Gibbs Medalist

Dr. Edward C. Franklin, professor emeritus of organic chemistry in Leland Stanford has been awarded the Willard Gibbs Medal for 1932 by the Chicago Section of the A. C. S. Presentation of the medal will take place before a national gathering on May 20.

"Dr. Franklin's work on liquid ammonia solutions," the citation reads, "opened up an entirely new field, and also modified profoundly our views on aqueous solutions. He has made a lifelong study, characterized by insight, thoroughness and experimental skill, of reactions in liquid ammonia."

Dr. Franklin has been honored by scientific societies in this country and abroad for his contributions to the field of organic chemistry. He is a past president of the A. C. S., and a holder of the William H. Nichols Medal for 1925.

Schmertz Honored

J. R. Schmertz, advertising manager, Mathieson Alkali was elected president of the Technical Publicity Association. He was a vice-president last year.

Others elected were: vice-presidents, George R. Holmes, S. K. F. Industries, Inc., and H. H. Wilkinson, of Permutit; secretary-treasurer, Sidney W. Dean, Jr., J. Walter Thompson Co.

Charles L. Huisking, president of Charles L. Huisking & Co. is in Norway on a business trip.

J. Enrique Zanetti, Columbia chemical professor is making a survey of the Chilean nitrate industry for the Chemical Foundation and the synthetic nitrate interests.

G. S. Whitby, director, Division of Chemistry, National Research Council of Canada, addressed the North Jersey Section, A. C. S., on "Synthetic Rubber," on March 14.

William Colgate, son of the late George and Jane Cauldwell Colgate, who died at his home on March 7 in his ninety-second year, left more than $1,000,000 to twenty-one religious, charitable and public institutions and more than $1,500,000 in personal bequests, according to his will, filed for probate in the Surrogate's Court of N. Y. City. Mr. Colgate retired from business more than forty years ago.

W. Robert Blum, United Piece Dye Works has been appointed to the Board of Directors of the Textile Color Card Association by Charles Pinnell, president and will represent the dyeing industry. Other industries having representation on the Board include cotton, silk, woolen, millinery, hosiery and shoe and leather.

Herty, A. I. C., Medalist

Dr. Charles H. Herty was presented with the medal of the American Institute of Chemists at a dinner at the Chemists' Club (N. Y.) on May 7.

Speakers at the dinner included: John H. Finley, associate editor, New York Times; Henry W. Jessup; Marston T. Bogert, professor of organic chemistry at Columbia, and Joseph E. Ransdell, formerly U. S. Senator from Louisiana.

J. Wrench, sales manager, Industrial Chemical Sales has taken to the lecture platform. His first talk was delivered before the Men's Club at St. Marys' Parish Club, Amityville, L. I., on the subject of "By-Products of Industry."

L. W. Hutchins, of Sheldon, Morse, Hutchins and Easton addressed the American Management Association at the Hotel Pennsylvania, N. Y. City on May 2nd.

Ralph M. Roosevelt, vice president Eagle-Picher Lead in charge of its New York office, was re-elected president of the American Zinc Institute for his fifth consecutive term on April 23rd.

R. R. Deupree, president, P & G Co., accompanied by C. J. Huff, sales manager, sailed for England to visit the company's English subsidiary, Thomas Hedley & Co., Ltd., at Newcastle. It is understood his visit is for the purpose of enlarging the company's facilities in England probably through expansion of the Hedley plants.

Dr. John C. Olsen, professor of chemical engineering at Brooklyn Polytechnic, and a former president of the A. I. Ch. E. addressed Brooklyn Kiwanians recently on "The Engineer and Business Recovery."

Dr. Henry Mace Payne, executive assistant, U. S. Timber Conservation Board addressed the Second Florida Commercial Forestry Congress at Ocala, Fla., on April 15th on the naval stores situation.

Willard E. Maston, vice-president and sales manager, Eagle Pitcher Lead, and president of the National Oil & Varnish Association was taken seriously ill recently in Cincinnati, suffering from an acute case of appendicitis.

H. S. Boutell, who has been at the head of Detroit Graphite, retired April 23rd, and has been succeeded by W. J. Nydan.

Government Extravagance

Lammot duPont, president, duPont de Nemours, and also president of the Manufacturing Chemists' Association, attacked useless expenditures in government in a public letter sent to "stockholders, employees and friends." He quickly followed this with a scathing letter on April 8th to Senator Daniel O. Hastings in which he disputed the Senator's assertion that it was not expedient to make any substantial reduction in the expense of running the government.

Said Mr. duPont in his first letter: "Taxes levied upon corporations and other producers increase the cost of their products. Higher costs lessen sales, slow down industry, increase unemployment and want; all of which drive costs still higher and further increase distress. Taxes upon individuals have a similar effect by curtailing their capacity to purchase the products of industry."

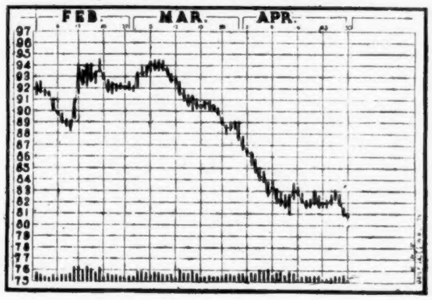
Commenting on the Hasting's statement Mr. duPont said: "The statement apparently attempts to prove that when government expenses have reached a high level it is not expedient and probably not possible to make any substantial reduction. I am not so easily convinced on this point and feel certain that sweeping economies should be made and can be made, provided our representatives in Washington will go at the problem aggressively."

The Financial Markets

Stocks Off Sharply In Listless Trading—Chemical Group Has Largest Losses—Officials Debate Cosach Financing—New Cyanamid Stock Admitted to Curb—Solid Carbonic and Dry Ice Combine

The stock market suffered a severe collapse in April. Each succeeding week found prices at lower levels. Liquidation has been carried to a point where in many instances stocks of even a conservative investment character are selling below the book-value. Every group was effected by the month's losses. The April decline followed a much less severe one in March. February was the last month in which any appreciable increase in values has taken place.

Daily Record of Stock Market Trend



New low levels for the present depression were reached on several different days in April.

Washington Probe

A number of adverse factors contributed to the unsettled feeling in the securities market. The Washington probe of supposed "bear" raids; the raising of the tax on stock sales; the proposed tax on stock dividends, and the general lack of definite signs of improvement in business conditions were some of the factors responsible for the severe decline. Wall Street is in the doldrums.

The loss in values of 240 stocks listed on the New York Stock Exchange, as listed by the N. Y. Times, composing the twenty largest groups, was $2,534,657,948 in April, equivalent to 26 per cent, compared with a depreciation of $1,925,902,983, or 17 per cent, in March. These stocks declined on an average 3.436 points, against 2.332 points in March. Every group recorded a loss, the largest sums being $654,350,346 in the public utility shares, $372,671,709 in the railroad and $345,560,928 in the chemical issues.

Future Outlook

The prevailing feeling in financial circles is that as long as the uneasiness caused by the political situation in Washington exists with the radical taxation program, soldiers' bonus, and inflationary schemes of one sort or another still unfavorable possibilities, no worthwhile improvement is likely. But it should not be entirely forgotten that Wall Street can reverse itself overnight. Gradual but sustained improvement in business is the spark plug that is urgently required to give the necessary impetus. The trouble has been that sporadic improvements have been vanishing into thin air before their weight could be felt in reducing unemployment, loosening credit, bringing out hoarded money, and restoring a semblance of confidence.

Chemical Values

Chemical stocks were a special target in April. The following compilation of losses in 20 groups shows that the depreciation in chemical stocks totalled $345,560,928 for nine issues. Only the loss in the public utilities group with 29 issues suffered a greater loss in values.

April, 1932

Group and Number of Issues	*Av. Net Ch'ge in Points*		*Change in Values*
Amusements (5).....	—1.650	—	$19,583,123
Building equip. (9)..	—1.694	—	20,687,068
Business equip. (4)..	—2.281	—	17,286,186
Chain stores (14)...	—2.473	—	92,002,127
Chemicals (9)......	**—6.486**	—	**345,560,928**
Coppers (15)........	—1.283	—	39,778,895
Depart. stores (10)..	—2.613	—	10,329,215
Foods (19)..........	—2.895	—	142,739,730
Leathers (4)........	— .375	—	290,413
Mail order (3)......	—4.458	—	59,916,650
Motors (15).........	—1.500	—	263,406,552
Motor equip. (7)....	—1.625	—	10,518,973
Oils (22)...........	— .619	—	270,043,429
Public utilities (29)..	—9.634	—	654,350,346
Railroads (25)......	—5.840	—	372,671,709
Railroad equip. (8)..	—1.016	—	15,095,583
Rubber (6).........	— .583	—	4,506,647
Steels (13).........	—3.221	—	128,641,902
Sugars (9).........	— .653	—	3,660,748
Tobaccos (14)......	—3.687	—	63,587,724
Avr. & tot. 240 issues	—3.436		—$2,534,657,948

The actual dollar and cents losses in a number of leading chemical common stocks are given below:

Allied Chemical & Dye....	.....	$51,327,531
Commercial Solvents Corp.	.....	3,479,008
Davison Chemical Co.....	.....	441,059
Du Pont de Nemours & Co.	.....	186,733,282
Mathieson Alkali Works...	.....	1,951,308
Texas Gulf Sulphur.......	.....	7,621,200
Union Carbide & Carbon...	.....	93,366,695
U. S. Industrial Alcohol...	.....	700,957
Virginia-Carolina Chemical	$60,112	....
Total.................	$60,112	$345,621,040

In a similar analysis to that of the N. Y. Times, the N. Y. Sun reported the largest depreciation in stocks since last September. The decline in chemical stocks amounted to 33 per cent which was the largest of any of the groups.

Average Price

CHEMICAL MARKETS' Average Price for 15 representative industrial chemical common stocks shows up the severity of April's losses. The decline between April 1 and April 29 amounted to $6.44. The price stood at the following figures on the five successive Fridays; April 1, $25.53; April 8, $22.32; April 15, $22.02; April 22, $19.67; April 29, $19.09. At the end of April 1931 the Price stood at $44.64.

Cosach Conference

Cosach officials attending the long drawn out series of conferences in N. Y. City have maintained complete silence on negotiations. *The South Pacific Mail*, a Valpariso monthly, reports that the main issue is the radical reduction in the capital structure of the company. The article states that international bankers are scrutinizing closely the present status before making further advances. The banking group are unfavorable to any change which would jeopardize the invest-

Price Trend of Chemical Company Stocks

	Apr. 1	*Apr. 8*	*Apr. 15*	*Apr. 22*	*Apr. 29*	*Net Change*
Allied Chem..........	73	65⅝	65⅜	58½	52½	—20½
Air Reduction........	49¼	44⅜	42¼	36⅝	35⅞	—13⅜
Anaconda............	6	4⅝	6	5¼	4⅞	— 1⅛
Columbian Carbon....	28	27¾	27⅜	23⅛	21⅞	— 6⅛
Com. Sol.............	7⅜	5⅞	6⅜	6½	6	— 1⅜
Du Pont.............	44⅛	38⅜	34	28⅞	28	—16⅛
Mathieson...........	14¼	13	13¼	14	12	— 2¼
Monsanto............	23	20½	20½	20¾	20¼	— 2¾
Stand. N. J..........	27⅞	26	24⅛	20¼	22⅝	— 5¼
Texas Gulf	20⅞	17	19	17½	17⅞	— 3
U. S. I..............	22⅝	21½	21¾	20½	20½	— 2⅛

ments already made. On the other hand, powerful inside elements are anxious to reduce the capital structure which would permit more economical operation of the company.

The *Mail* says it understands the bankers contend that the present stocks of nitrate in Europe are sufficient for two years and therefore argue that continued production by the Chilean plants is unnecessary.

The corporation was asked to furnish data regarding the alleged economy of the Guggenheim process used at the Tocopilla plants as compared with the Shanks process formerly employed.

Defaulters

Announcement was made April 30 that interest payable May 1 on the Anglo-Chilean Consolidated Nitrate Corporation's 20 year 7 per cent sinking fund debentures due in 1945 would not be paid.

The issue in default is one which was offered in the amount of $16,500,000 in October, 1925 and about $14,600,000 are still outstanding. The N. Y. Stocks Exchange announced April 30 that the bonds would be dealt in flat until further notice.

In London, May 5, announcement was made of the formation of committee of British bankers and the following statement given to the press:

"The selection of a committee of British bankers and other representatives of British security holders is in pursuance of the effort being made to arrive at some comprehensive plan for the reorganization of Cosach on a basis conforming to changed world conditions.

"Members of the British committee are the Hon. Alexander Baring; Sir Bertram Hornsby; A. A. Jamieson, Robert Fleming & Co., Ltd.; H. P. Lawson; A. Levine, on behalf of the British Insurance Association; L. A. Stride, Trust Ltd.; Henry F. Tiarks, and A. H. Winn."

Over the Counter Prices

	Mar. 31, 1932 Bid	Mar. 31, 1932 Asked	Apr. 29, 1932 Bid	Apr. 29, 1932 Asked
J. T. Baker......	9	13	9	13
Dixon..........	30	45	31	38
Merck, pfd......	55	59	48	53
Petroleum Deriv..	3	6	2¼	5
Solid C..........	2¾	4½	2¼	3
Tubize B.........	38	43	32	38
Worcester Salt...	85	87	80	85
Young, J. S......	83		70	
Young, J. S. pfd..	90		85	

W. D. Ticknor, president Commercial Solvents was elected a director of the B. F. Goodrich Co.

Foreign Markets

London	March 31	April 29
British Celanese.........	7s 10½d	6s 3d
Celanese..............	£1	12s 6d
Courtaulds.............	£1⅝	£1⅜
Distillers..............	47s	42s 6d
Imperial Chemical.......	16s 1½d	14s
Un. Molasses...........	8s 3d	5s
Paris		
Kuhlmann.............	450 frs	390
L'Air Liquide..........	850	690
Milan		
Montecatini............	118½ lire	85¼ lire
Lina Viscosa...........	152½	120¾
Italgas................	17½	12
Berlin		
I. G. Farm.............	—	98rm.

Dividends and Dates

Name	Div.	Stock Record	Payable
Allied Chem. & Dye	$1.50	Apr. 15	May 2
Amer. Smelt & Refg			
7%............	1¾	May 6	June 1
6%............	1½	May 6	June 1
Archer-Daniels-Mid	1¾	Apr. 20	May 1
Atlas Powder......	1½	Apr. 20	May 2
Canadian Ind......	.62½	Mar. 31	Apr. 30
Common (extra)...	.25	Mar. 31	Apr. 30
Colgate-Pal-Peet...	.62½	Apr. 11	Apr. 20
Preferred.......	1½	June 10	July 1
Columbian Carbon.	.75	Apr. 15	May 2
Consol. Chem. Indus.	.37½	Apr. 15	May 2
Dom. Tar & Chem..	1⅜	Apr. 6	May 1
du Pont-(debenture)	1½	Apr. 9a	Apr. 25
Hercules Powder...	1¾	May 3	May 14
Imperial Chem. Ind.	3	Apr. 15	June 8
Intern. Nickel.....	1¾	Apr. 2a	May 2
7%............	8¾	Apr. 2	May 2
Liq. Carbonic Corp.	.50	Apr. 20	Apr. 30
Nat'l Carbon......	2	Apr. 20a	May 2
Nat'l Dist'l'rs Prod.	.50	Apr. 15	May 2
Nat'l Lead........	1½	Apr. 22a	May 2
Sharp & Dohme...	.87½	Apr. 15	May 1
Solvay Amer. Invest	1⅜	Apr. 15	May 16
Spenser-Kellogg & Sons............	.15	June 15a	June 30
Vulcan Detinning .	.50	Apr. 7a	Apr. 20
Preferred.......	1¾	Apr. 7a	Apr. 20

aTransfer books not closed for this dividend.

CO_2 Amalgamation

Solid Carbonic and Dry Ice were amalgamated in April. The combination, with manufacturing plants at Niagara Falls, Deepwater Pond, N. J., Elizabeth, N. J. and Peoria, will control substantially more than half of the entire capacity of the industry with a wide distribution throughout the East and Middle West.

The merger, will provide means for expanding activities in territories showing the greatest promise of increased sales. Adequate supply of raw material will be assured through arrangements with Union Carbide, du Pont and Commercial Solvents.

Certificate of incorporation of Dry Ice Corp. is to be amended so as to provide for an authorized capital of 150,000 shares of a par value of $5 each. Of these, 134, 516¼ shares are to be presently issued in exchange for outstanding stock of Dry Ice Holding Corp. and the Solid Carbonic Co., Ltd., leaving the balance available for future needs.

Orlando F. Weber, Allied Chemical chairman commenting on first quarter dividends stated at the annual meeting, "net earnings for the first quarter were substantial, although not quite sufficient for dividend requirements for the period." The regular dividend of $1.50 a share on the common stock for the first quarter recently was declared.

American Cyanamid stockholders approved change in common stock to shares of $10 par value from shares of no par value, which will effect a substantial saving in franchise taxes to the company, as well as in transfer taxes to stockholders.

N. Y. Curb Exchange has admitted to unlisted trading privileges new Class A and Class B common stock of American Cyanamid Co. and has removed from trading the old Class A and Class B issues. New issues are of $10 par and were exchanged on a share-for-share basis for the old stock.

Dividend Action

Sherwin Williams declared quarterly dividend of 75 cents on common stock payable May 16 to stock of record April 30. This places stock on $3 annual basis against $4 previously. Regular quarterly dividend of $1.50 on the preferred also was declared, payable June 1 to stock of record May 14.

American Smelting & Refining Co. omitted quarterly dividend on common stock due at this time. Three months ago dividend was reduced to 12½ cents from 37½ cents. On August 1, 1931, a dividend of 50 cents was declared, prior to which the stock had been on a $4 annual basis.

St. Joseph Lead Co. has omitted the quarterly dividend of 15 cents due at this time.

I. G. has decided to declare common dividend of 7 per cent for 1931, as against 12 per cent paid during the past several years.

Maintenance of the 12 per cent dividend last year was only possible because it was paid out on a reduced capital stock. The I. G. acquired 35,714,000 marks of its shares during 1930, which brought its total holdings to 49,916,800 marks. These were listed at par value and were further increased in 1931.

Vulcan Detinning quarterly dividend on common stock due at this time. Three months ago a dividend of 50 cents was paid, prior to which the company had been paying $1 quarterly.

Regular quarterly dividend of $1.75 on preferred stock declared, payable July 20 to stock of record July 7.

Lehn & Fink declared quarterly dividend of 50 cents on common stock, placing issue on a $2 annual basis, as against $3 previously. Dividend is payable June 1 to stock of record May 16.

Several leading chemical stocks were selling below the book value in the severe decline registered in the April market. Included in the list were:

Stock	Book Values Dec. 31 1931	Closing Prices Apr. 23 1932	High Prices 1929
Air Reduction.......	$40.61	$37⅞	$223⅞
Allied Chem. & Dye...	89.68	59	354¾
Corn Products.......	34.69	32	126⅞
Du Pont de Nemours.	35.38	29½	231
Eastman Kodak.....	57.96	54	264¾
Std. Oil Co of N. J....	†49.52	20½	83
Texas Gulf Sulphur...	12.69	17⅞	85‡

*Adjusted because of split-up.
†Book values Dec. 31, 1930.
‡Last price.

Earnings at a Glance

Company	Annual Dividends	Net Income 1932	Net Income 1931	Common Share Earnings 1932	Common Share Earnings 1931
Amer. Zinc, Lead & Smelting:					
Mar. 31, quarter.	f....	†$15,906	$103,564	...	p$1.29
Comm'l Solvents:					
Mar. 31, quarter.	$ .60	$293,454	$537,544	h$.11	h$.21
Corn Prod. Refining:					
Mar. 31, quarter.	3.00	2,111,173	2,389,379	.66	.77
du Pont de Nemours:					
Mar. 31, quarter.	4.00	9,689,433	12,656,929	j.74	j1.01
Indust'l Rayon Corp.:					
Mar. 31, quarter	4.00	177,649	13,364	1.22	.09
Johns-Manville:					
Mar. 31, quarter.	f....	†912,607	230,109	...	.13
Mathieson Alkali:					
Mar. 31, quarter.	2.00	250,285	290,403	.32	.39
		1931	*1930*	*1931*	*1930*
Aluminum Co.:					
Year Dec. 31....	f....	$3,910,054	$10,868,685	p$2.66	$1.38
British Aluminum Co., Ltd.:					
Year, Dec. 31....	....	£112,427	£133,549	5.23%	11.19%
Carman & Co.:					
Year, Dec. 31....	m...	83,562	218,838	b.11	b1.84
Eastman Kodak:					
Year, Dec. 26....	5.00	13,408,785	20,353,788	5.78	8.84
Koppers Gas:					
Year, Dec. 31.....	p6.00	2,458,187	3,140,113	p12.29	p15.70
MacAndrews & Forbes & Subsidiaries;					
Year, Dec. 31....	$1.40	$764,664	$1,002,182	h$1.94	h$2.60
United Dyewood:					
Year, Dec. 31....	f....	146,069	195,887	p3.87	p5.06

fNo common dividend. †Net loss. pOn preferred stock. mNo class b dividends. hOn shares outstanding at respective periods.

Texas Gulf Net $1,722,535

Texas Gulf Sulphur reports for quarter ended March 31, 1932, net income of $1,722,535 after depreciation and federal taxes, but before depletion, equivalent to 68 cents a share on 2,540,000 no-par shares of stock. This compares with $2,448,198 or 96 cents a share in first quarter of 1931.

During first quarter of 1932, company decreased its reserves, including reserves for depreciation and federal taxes, $12,327 making total of these reserves $13,624,577 on March 31, last.

Statement for quarter ended March 31, 1932, compares as follows:

	1932	*1931*	*1930*	*1929*
*Net income..........	$1,722,535	$2,448,198	$3,803,701	$3,880,260
Dividends............	1,270,000	2,540,000	2,540,000	2,540,000
Surplus..............	$452,535	‡$91,802	$1,263,701	$1,340,260
†P & L surp..........	26,340,783	25,108,843	22,652,261	16,641,343

*After depreciation and federal taxes. †Includes reserve for depletion. ‡Deficit.

Mathieson Quarter Earnings Hold

Mathieson Alkali Works, Inc., for quarter ended March 31, 1932, shows net income of $250,285 after depreciation, depletion, federal taxes, etc., equivalent after dividend requirements on 7% preferred stock, to 32 cents a share on 650,436 shares of no-par common stock. This compares with $297,403 or 39 cents a share in first quarter of 1931.

Income account for quarter ended March 31, 1932, compares as follows:

	1932	*1931*	*1930*	*1929*
Total earn............	$538,586	$605,140	$866,412	$831,314
Depr & depl..........	286,341	285,064	281,639	257,260
Oper prof............	$252,245	$320,076	$584,773	$574,054
Inc cred (net).........	14,477	11,067	20,923	6,689
Total inc............	$266,722	$331,143	$605,696	$580,743
Fedl tax	16,437	33,740	63,750	74,068
Net income.........	$250,285	$297,403	$541,946	$506,675

Commercial Solvents Corp. reports for quarter ended March 31, 1932, net profit of $293,454 after depreciation, interest, federal taxes and reserves, equivalent to 11 cents a share on 2,530,174 no-par shares of common stock. This compares with $537,544 or 21 cents a share on 2,529,873 shares in first quarter of 1931.

Du Pont Reports 74 Cents in Quarter

Du Pont and wholly owned subsidiaries for quarter ended March 31, 1932, shows net income of $9,689,433 after depreciation, obsolescence, interest, federal taxes, etc., comparing with $12,656,929 in first quarter of 1931.

After deducting debenture dividends and including $3,345 company's equity in undivided profits or losses of controlled companies not consolidated, there was a balance available for common stock in first quarter of 1932, of $8,059,134, equivalent to 74 cents a share (par $20) on 10,943,767 average number of common shares outstanding during the period. These earnings include dividends from General Motors Investment amounting to 45 cents a share on du Pont common stock.

In first quarter of 1931, balance available for common stock, including $65,661 equity in undivided profits or losses of controlled companies not consolidated, was $11,229,595, equal to $1.01 a share on 11,065,762 average common shares. Earnings for that quarter included dividends from General Motors investment amounting to 68 cents a share on du Pont common.

Profit and loss surplus on March 31, 1932, was $186,050,164, comparing with $198,933,044 on Dec. 31, 1931 and $208,186,635 on March 31, 1931.

Consolidated income account for quarter ended March 31, 1932, compares as follows:

	1932	*1931*	*1930*	*1929*
Oper income..........	$7,164,511	$7,319,618	....	....
Depr. & obsol.........	3,303,383	3,049,039	....	....
Balance..........	$3,861,128	$4,270,579	$6,748,281	$7,442,844
Inc G M inv..........	4,989,333	7,484,000	10,481,065	17,466,131
Other inc............	1,262,577	1,232,504	1,008,782	1,096,119
Total inc.........	$10,113,038	$12,987,083	$18,238,128	$26,005,094
Fedl tax.............	405,617	312,017	872,290	744,560
Interest.............	17,988	18,137	18,212	20,689
Net inc..........	$9,689,433	$12,656,929	$17,347,626	$25,239,845
Deb divs.............	1,633,644	1,492,995	1,492,979	1,392,168
Com divs.............	10,957,449	11,063,084	13,457,155	19,819,672
Deficit...........	$2,901,660	§$100,850	§$2,397,492	§$4,028,005
†Prev surp...........	198,933,044	208,082,665	144,920,215	105,710,319
*Addit surp...........	....	....	7,467,060	....
Prem on com stock	....	3,120	....	....
Reval GM stk........	‡9,981,220	....	22,457,745	24,953,050
P&L surp........	$186,050,164	$208,186,635	$177,242,512	$134,691,374

*Surplus from issue of common stock sold under executives trust and bonus plans. †Surplus on December 31. ‡The value of du Pont Company's investment in General Motors Corp. common stock, equivalent to 9,981,220 shares, was adjusted on books of company in March, 1932, to $168,682,618, which closely corresponded to its net asset value as shown by balance sheet of General Motors Corp. at December 31, 1931. These shares are now valued at $16.90 a share, previous valuation having been $17.90 a share. §Surplus

Air Reduction Profit $652,214

Air Reduction reports for quarter ended March 31, 1932, net profit of $652,214 after depreciation, federal taxes, etc., equivalent to 77 cents a share on 841,288 no-par shares of stock. This compares with $1 019,040 or $1.21 a share in the first quarter of 1931.

The consolidated income account for the quarter compares as follows:

	1932	*1931*	*1930*	*1929*
Gross inc.................	$3,349,913	$4,479,015	$5,451,718	$4,732,385
Oper exp..................	2,238,196	2,814,798	3,244,677	2,894,520
Oper inc................	$1,111,717	$1,664,217	$2,207,041	$1,837,865
Depr, etc.................	392,776	519,593	513,328	431,671
Profit.................	$718,941	$1,144,624	$1,693,713	$1,406,194
Federal tax...............	66,727	125,584	170,437	168,632
Net profit.............	$652,214	$1,019,040	$1,523,276	$1,237,562

Monsanto Chemical and subsidiaries report for quarter ended March 31, 1932, net profit of $275,859 after charges, depreciation, federal taxes, etc., equivalent to 64 cents a share on 429,000 no-par shares of capital stock. This compares with $255,378 or 59 cents a share in first quarter of 1931.

Current assets as of March 31, 1932, including $2,111,844 cash and marketable securities, amounted to $6,002,937 and current liabilities were $967,688. This compares with current assets of $5,895,505 and current liabilities of $940,254 on December 31, 1931. Earned surplus as of March 31, last, totaled $2,795,557, against $2,653,011 at close of 1931.

American Smelting 1931 Net $874,976

American Smelting & Refining has issued its pamphlet report for year ended Dec. 31, 1931, showing consolidated net income of $874,976, after interest, depreciation, depletion and federal taxes, equivalent to $1.75 a share on 500,000 shares of 7% preferred stock. This compares with net income of $11,098,751, equal, after deducting preferred dividends, to $3.77 a share on 1,829,940 no-par shares of common stock in 1930.

Current assets as of Dec. 31, 1931, including $20,943,979 cash and United States government securities, amounted to $69,163,087, and current liabilities were $10,979,908. This compares with cash and United States government securities of $24,932,505, current assets of $84,702,713, and current liabilities of $14,767,493 at close of 1930.

Consolidated income for year 1931 compares as follows:

	1931	*1930*	*1929*	*1928*
Net earn	$9,278,957	$19,750,285	$32,659,728	$29,037,465
Other inc	953,634	1,815,271	1,803,143	2,064,298
Gross inc	$10,232,591	$21,565,556	$34,462,871	$31,101,763
Ad exp. etc	1,781,654	2,119,800	2,093,686	1,894,942
*Corp. tax	364,905	671,489	2,314,369	2,421,345
Interest	1,794,646	1,828,434	1,886,982	2,188,821
Depr depl etc	5,416,410	5,847,082	6,336,251	6,010,452
Net income	$874,976	$11,098,751	$21,831,583	$18,586,203
1st pfd divs	3,500,000	3,500,000	3,500,000	3,500,000
2nd pfd divs	1,200,000	708,337	....	....
Com divs	3,659,927	7,319,760	7,319,760	5,489,820
Deficit	$7,484,951	$429,346	†11,011,823	‡$9,596,383
Prev surp	37,540,618	44,281,168	35,282,584	27,047,225
Total surp	$30,055,667	$43,851,822	$46,294,407	$36,643,608
†Cont res	....	....	1,119,901	125,161
Mtl stk res	1,706,500	5,704,000	....	....
Reduct of prop acct	5,000,000	....	....	....
Other res	....	607,204	893,338	1,235,863
P & L sur	$23,349,167	$37,540,618	$44,281,168	$35,282,584

*Includes estimated federal taxes. †For extraordinary obsolescence, contingencies, etc. ‡Surplus.

Imperial Chemical 1931 Report

Imperial Chemical Industries, Ltd., for year ended Dec. 31, 1931, shows net profit of £3,408,290, after reserve for obsolescence and depreciation and provision for income taxes, equivalent, after dividends paid on preference stock, to 4.18% on £43,589,601 ordinary shares (par £1). This compares with net profit in 1930 of £4,473,392, equal, after dividends paid on preference and ordinary stocks, to 2.79% on £10,868,259 deferred shares (par 10s).

Income account of Imperial Chemical Industries, Ltd., for year ended Dec. 31, 1931, compares as follows:

	1931	*1930*	*1929*
Gross profit	£4,668,685	£5,129,757	£6,502,340
General res	......	......	529,020
Res for obsol	1,000,000	500,000	575,478
Prov for inc tax	260,395	156,365	146,654
Net profit	£3,408,290	£4,473,392	£5,251,188
Bal from prev year	653,483	349,926	108,807
Total	£4,061,773	£4,823,318	£5,359,995
Pref divs	1,583,416	1,554,554	1,407,755
Ordinary divs	1,961,532	2,615,281	3,383,964
Divs on def stock	......	......	217,353
Balance car forward	£516,825	£653,483	£350,923

I. G. Reports Profit of Rm. 155,308,000

I. G. Farbenindustrie A. G. reports gross profit for year ended Dec. 31, 1931, of rm. 155,308,000 against rm. 217,481,000 in preceding year. Net profit after deducting interest, taxes, depreciation, etc. for year 1931 was rm. 44,515,000 comparing with rm. 89,220,000 in 1930. After dividends paid in 1931 amounting to rm. 47,950,000 against rm. 85,546,000 in previous year, and directors fees there was a debit of rm. 4,462,000 which was deducted from last year's credit balance of rm. 6,944,000, leaving rm. 2,482,000 carried forward.

Report states color, drugs and photo business was satisfactory, but nitrate sales were down 16% and synthetic gasoline showed losses. In 1932 sales of all products show decreases.

Atlas Powder Shows Net Loss

Atlas Powder reports for quarter ended March 31, 1932, net loss of $79,230 after depreciation, taxes, etc. This compares with net profit of $157,291, equivalent after dividend requirements on 6% preferred stock, to four cents a share on 261,438 no-par shares of common stock in first quarter of 1931.

Current assets as of March 31, last, including $5,131,026 cash, bank acceptances, U. S. government securities and other marketable securities at cost, amounted to $10,665,737 and current liabilities were $545,426. This compares with cash and marketable securities of $4,670,921, current assets of $11,367,961 and current liabilities of $756,727 on March 31, 1931. Above current assets include investment in company's preferred and common stocks and employes' stock subscription accounts. Surplus amounted to $4,206,626 against $8,103,370 on March 31, of preceding year.

Consolidated income account for quarter ended March 31, 1931, compares as follows:

	1932	*1931*	*1930*	*1929*
Net sales	$2,078,210	$3,299,121	$4,253,635	$5,609,638
‡Net loss	79,230	†$157,291	†$350,697	†$523,089
Pfd divs	147,913	148,006	135,000	135,000
Def aft pfd divs	$227,143	*$9,285	*$215,697	*$388,089

*Surplus. †Profit. ‡After, depreciation, taxes, etc.

Tennessee Corp. and subsidiaries for year ended Dec. 31, 1931, shows net profit of $5,365 after depreciation, interest, taxes, etc., equivalent to less than 1 cent a share on 857,871 no-par shares of capital stock. This compares with $1,034,907, or $1.20 a share, on 857,761 shares in 1930.

Company bought $100,000 of Series B bonds for the sinking fund, reducing outstanding bonded indebtedness Dec. 31, 1931 to $3,107,900. Depreciation writeoff was less than during ordinary years because, with output smaller, wear and tear on machinery was less.

Consolidated income account for year 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
Sales	$7,572,760	$12,106,518	$12,395,407	$10,223,579
Misc inc	125,439	211,054	454,365	277,902
Total inc	$7,698,199	$12,317,572	$12,849,772	$10,501,481
Costs, exp, tax, etc.	7,231,051	10,246,843	10,150,579	8,717,857
Interest	190,474	196,474	192,670	88,801
Res for min int	235	13,747	37,959	......
Depr res	271,074	752,036	458,252	427,597
Fed tax res	......	73,565	132,881	......
Net profit	$5,365	$1,034,907	$1,877,431	†$1,276,226
Dividends	214,454	857,683	847,605	596,566
Deficit	$209,089	*$177,224	*$1,029,826	*$670,660

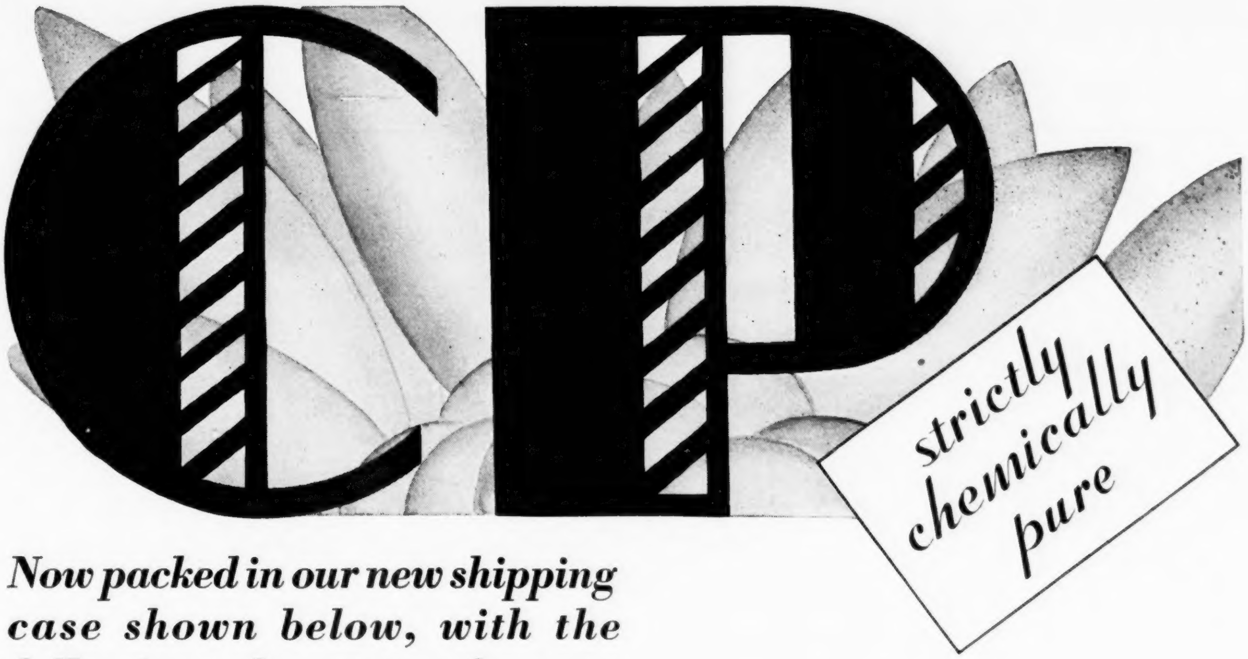
*Surplus. †Profit before federal taxes.

Adolph Lewisohn, president, Tennessee Corp., says in annual report:

"Low prices of cotton and other agricultural products have severely reduced purchasing power of the farmer, and, consequently, the demand for fertilizer. This in turn has affected very adversely consumption of sulfuric acid, one of the principal constituents in the manufacture of fertilizer. "The price of copper also has a pronounced effect upon earnings. Sales of "Loma" were the largest since this product was introduced to the public."

Carman & Co., Inc., and subsidiaries for year ended Dec. 31, 1931, shows consolidated net profit of $83,562 after charges and federal taxes. After deducting dividends on $2 Class A stock, the balance available for sinking fund requirements and Class B stock was equivalent to 11 cents a share on 76,814 no-par shares of Class B stock. This compares with net profit in 1930 of $218,838, equal to $1.84 a share on 76,781 Class B shares.

Parker Rust-Proof Co. reports for quarter ended March 31, 1932, surplus of $96,116 after charges, depreciation and preferred dividends, but before federal taxes, comparing with $208,830 in first quarter of 1931.



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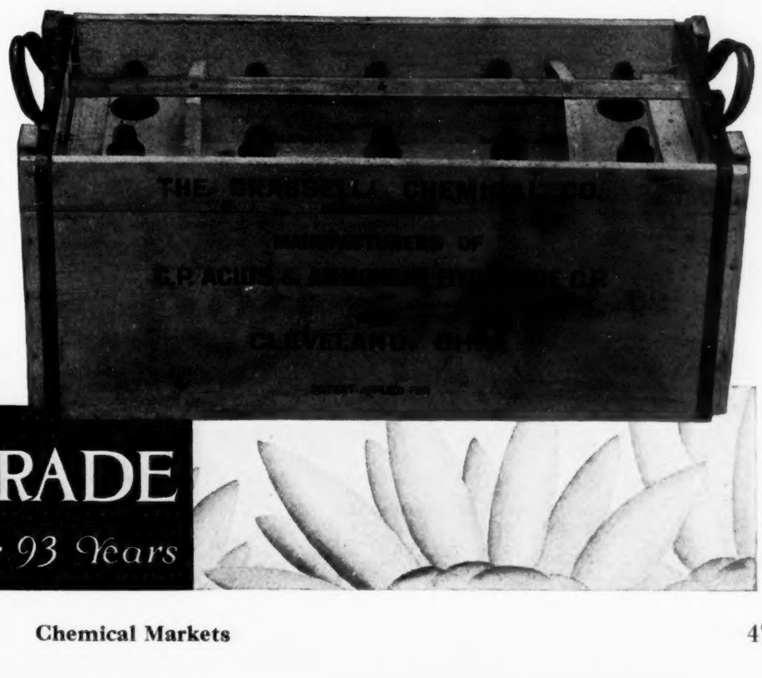

GRASSELLI GRADE

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The Industry's Stocks

Last	1932 Apr. High	1932 Apr. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Apr.	During 1932	ISSUES	Par $	Shares Listed	An. Rate		Earnings $-per share-$ 1931	1930
									NEW YORK STOCK EXCHANGE						
36¼	51	35¾	62½	35¾	109⅞	47⅞	96,300	298,400	Air Reduction	No	830,000	$3.00		4.54	6.32
53⅛	75½	52¼	87½	52¼	182⅝	64	490,100	1,635,000	Allied Chem. & Dye	No	2,401,000	6.00			9.77
104	117	96½	119	96½	133¼	100	3,100	7,100	7% cum. pfd.	100	393,000	7.00			
4⅞	5½	4¼	7½	4½	29¾	5⅛	4,800	11,300	Amer. Agric. Chem.	100	333,000		Yr. Je. '30		Nil
8	10	7½	11	6½	14½	5	38,400	257,900	Amer. Com. Alc.	No	389,000				d1.27
38½	44⅝	36¼	51⅜	36¼			26,500	75,035	American Home Products	No	611,000	.35			
9½	10¾	7½	18⅝	7½	58½	17½	43,300	250,200	Amer. Smelt. & Refin.	No	1,830,000	4.00			3.77
45	57	45	85	45	138½	75	4,600	11,600	7% cum. pfd.	100	500,000	7.00			
...	...	...	...	...	4½	¼		76,200	Amer. Solvents & Chem.	No	503,000				d2.86
8¼	9½	7¼	12	7¼	18	10⅛	5,700	14,300	Archer Dan. Midland	No	550,000	2.00	Yr. Aug. 30		1.68
⅝	⅞	⅝	1⅛	½			9,400	106,600	Armour & Co.	No	50,000,000				
10⅛	16	9⅜	25½	9⅜	54	18	7,400	14,300	Atlas Powder Co.	No	265,000	4.00		.59	2.67
...	61	57½	79½	57½	99⅞	77½	1,360	2,570	6% cum. pfd.	100	96,000	6.00			
2¼	3½	2¼	5	2¼			3,800	22,700	Celanese Corp. of America	No	1,000,000				
1¾	2⅛	1½	3⅜	1½	7½	2¼	3,800	10,200	Certain-Teed Products	No	400,000				d7.61
8¼	8¼	8¼	15½	8¼	25⅛	8¼	100	800	7% cum. pfd.	100	63,000				
22¼	27¾	22	31½	22	50½	24	11,600	38,900	Colgate-Palmolive-Peet	No	2,000,000	2.50			3.76
22	30⅞	21½	41⅞	21½	111⅜	32	61,800	259,200	Columbian Carbon	No	499,000	5.00			5.04
6¼	7⅜	5½	10¼	5½	21½	6⅝	100,900	483,500	Comm. Solvents	No	2,530,000	1.00		.83	1.07
32⅝	41¾	29⅛	47⅜	29⅛	86⅝	36½	91,300	258,700	Corn Products	25	2,530,000	3.00			4.82
112	126	104	129½	104	152¼	116	1,050	2,700	7% cum. pfd.	100	250,000	7.00			
2⅛	3¼	2	5¼	2	23	3¼	7,800	32,900	Davison Chem. Co.	No	504,000		Yr. Je. '30		4.00
9¾	11⅞	9¾	13¼	9¾	19⅛	8¼	1,700	2,500	Devoe & Raynolds "A"	No	160,000	1.20			2.24
...	80½	80	95	80	109	100	30	140	7% cum. 1st pfd.	100	16,000	7.00			
38	48½	33¾	57	33¾			168,000	541,500	Drug, Inc.	No	3,501,000	1.00			
28½	45¾	27¾	59¾	27¾	107	50⅜	767,100	2,539,900	DuPont de Nemours	20	11,014,000	4.00		4.29	4.52
90	103¾	90	105	90	185⅜	91½	5,700	16,700	6% cum. deb.	100	978,000	6.00			
48¾	73	47½	87⅞	47½	185¾	77	122,600	524,100	Eastman Kodak	No	2,261,000	5.00			8.84
...	119	110	119	99	135	103	160	550	6% cum. pfd.	100	62,000	6.00			
14¾	16⅞	14	19½	14	43½	13½	24,100	122,900	Freeport Texas Co.	No	730,000	4.00		3.26	w4.77
4⅝	5⅜	4¼	7	4¼	16⅛	4⅝	6,800	27,100	Glidden Co.	No	695,000		Yr. Oct. '30		Nil
35	42	35	54	35	80	40	250	450	7% cum. prior pref.	100	74,000	7.00	Yr. Oct. '30		Nil
17	22	17	28⅛	17	43½	13½	1,200	4,800	Hercules Powder Co.	No	603,000	3.00		1.04	2.61
...	90	79	94¾	79	119½	95	790	1,830	7% cum. pfd.	100	114,000	7.00			
25⅜	28	24½	38⅜	23⅛	86	21	16,700	121,300	Industrial Rayon	No	200,000	4.00			7.74
⅜	½	⅜	1½	¼	5½	1	2,800	10,000	Intern. Agric.	No	450,000		Yr. Je. '30		1.68
3¾	5	3¾	7⅛	3¾	51½	4½	800	3,200	7% cum. prior pfd.	100	100,000	7.00	Yr. Je. '30		14.58
⅝	1	⅝	1⅞	⅝			12,400	79,000	Intern. Combustion	No	1,049,513				
5½	7⅜	5¼	9¼	5¼	20⅛	7	184,500	742,800	Intern. Nickel	No	14,584,000	1.00			.67
16¾	16¾	14	23½	14	42	18	7,400	29,800	Intern. Salt	No	240,000	3.00			
9	9¾	9	10	9	16½	9	10,200	11,900	Kellogg (Spencer)	No	598,000	0.80			h1.14
¼	¾	⅛	9⅛	⅛			461,400	3,502,300	Kreuger & Toll						
33⅞	43½	33½	56¾	33½			49,300	259,900	Lambert	No	748,996	8.00			
15½	18½	15	24¼	15			7,400	48,600	Lehn & Fink	No	419,166	3.00			
11¾	17½	11¾	22	11¾	55⅛	13½	10,400	37,900	Liquid Carbonic Corp.	No	342,000	4.00		2.96	5.22
2¾	3¾	2⅛	5½	2⅛	17	3⅝	23,300	63,400	McKesson & Robbins	No	1,073,000	1.00			.96
6⅝	9	4⅛	23	4⅛	37⅝	16	10,500	21,680	conv. 7% cum. pref.	50	428,180	3.50			
10⅞	12	10	15¼	10	25	13	3,900	5,900	MacAndrews & Forbes	No	340,000	2.60			2.61
12	14⅞	12	20⅞	12	31½	12	9,200	34,600	Mathieson Alkali	No	650,000	2.00		1.88	2.96
...	100⅛	89¾	118	89¾	125⅜	106½	470	1,110	7% cum. pfd.	100	28,000	7.00			
20½	23¼	20⅛	30¼	20⅛	29	16½	11,000	46,900	Monsanto Chem.	No	416,000	1.25			1.71
18	19¾	17½	24½	17¼	36⅜	16	8,400	77,500	National Dist. Prod.	No	252,000	2.00		—	1.23
53½	80¼	53¼	92	53¼	132	78½	6,200	9,200	National Lead	100	310,000	5.00			7.58
102½	121	100	125	100	143	111	3,050	5,210	7% cum. "A" pfd.	100	244,000	7.00			
85½	100	85	105	85	120	102	820	1,220	6% cum. "B" pfd.	100	103,000	6.00			
21½	24⅜	21	32¾	21	46½	22	9,400	44,500	Penick & Ford	No	425,000	1.00			4.01
30½	32¼	25½	42¾	25½	71½	36⅜	79,200	307,700	Procter & Gamble	No	6,410,000	2.40	Yr. Je. '30		3.36
18	24⅛	16¾	27½	16¾	51⅜	23½	155,700	407,200	Standard Oil, Calif.	No	12,846,000	2.50			2.88
22⅜	28¾	19⅞	31½	19⅞	52½	26	771,200	1,514,400	Standard Oil, N. J.	25	25,419,000	1.00			1.65
8½	9⅜	8	10⅜	8	26	8⅜	247,300	941,700	Standard Oil, N. Y.*	25	17,809,000	1.60			.92
1⅜	1¾	1⅛	2⅜	1⅛	9⅛	2	3,600	15,600	Tenn. Corporation	No	857,000	1.00			1.21
18	21½	16	26¾	16	55¾	19½	93,600	274,000	Texas Gulf Sulphur	No	2,540,000	4.00		3.52	5.50
18	28⅛	17¾	36⅜	17¾	72	27½	460,000	1,161,500	Union Carbide & Carb.	No	9,001,000	2.60			3.12
9	12	7½	14	7½	28¾	6½	11,900	42,900	United Carbon Co.	No	398,000			—	1.43
20½	23¼	19¼	31½	19¼	77⅜	20⅜	88,600	486,700	U. S. Ind. Alc. Co.	No	374,000	6.00		—	z2.96
7⅞	12½	7⅛	18⅛	7⅞	76¾	11	48,600	899,200	Vanadium Corp. of Amer	No	378,000	3.00			2.95
⅜	⅜	⅜	⅜	...	3¼	¼	1,800	852,400	Virginia Caro. Chem.	No	487,000		Yr. Je. '30		Nil
3⅛	4⅛	3⅛	4⅛	⅛	17	2¼	2,900	4,800	6% cum. part. pfd.	100	213,000		Yr. Je. '30		2.63
24½	24½	20	39½	9	72	35	2,500	6,400	7% cum. prior pfd.	100	145,000	7.00	Yr. Je. '30		11.96
5⅛	9	5⅛	12⅜	5⅛	40	7⅜	2,900		Westvaco Chlorine Prod.	No		2.00		1.79	2.51
									NEW YORK CURB						
5¼	6½	5¼	6⅞	5¼	8⅛	5	1,200	2,400	Acetol Prod. conv. "A"	No	60,000				
1¼	2½	1¼	3	1¼	19½	1¼	1,100	8,300	Agfa Ansco Corp.	No	300,000				
25	41½	24	61¾	24	224	48	12,000		Aluminum Amer.	No	1,473,000				z1.93
37	51½	36	67¾	36	109⅜	56¾	4,430	10,130	6% cum. pfd.	100	1,473,000	6.00			
2¾	3¼	2¾	5⅜	2¾	12¾	2⅜	40,900		Amer. Cyanamid "B"	No	2,404,000				
¼	¼	¼	⅜	¼	15	¼	3,200		Anglo-Chilean Nitrate	No	1,757,000		Yr. Je. '30		Nil
⅜	1½	⅜	1½	⅜	4	¼	800	1,200	Assoc. Rayon Corp.	No	1,200,000		Yr. Je. '30		1.87
...	...	...	...	...	60	32½			conv. 6% cum. pfd.	100	200,000	6.00			

h 11 mos. ending Aug. 30
w 13 mos.
z Before inventory adjustment
* Socony Vacuum

1932 Apr. Last	1932 Apr. High	1932 Apr. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Apr.	Sales During 1932	ISSUES	Par $	Shares Listed	An. Rate		Earnings $-per share-$ 1931	1930
1¼	1⅜	1¼	1¾	1¼	2⅜	⅞	1,500	9,000	Brit. Celanese Am. Rcts	2.43	2,806,000				
12	16	12	24¾	12	81½	16½	825	3,000	Celanese 7% cum. part. 1st pfd	100	148,000	7.00			
24½	24½	24½	42	22	65	25	100	4,100	" 7% cum. prior pfd	100	115,000	7.00			
2	2	2	3	2	...	...	200	1,450	Celluloid Corp.	No	195,000				
5¾	5¾	5¾	5⅞	5½	9	5¾	100	300	Courtaulds, Ltd.	1£					
...	31	25¾	35¾	25¾	51	30¼	800	1,600	Dow Chemical	No	630,000	2.00			3.44
...	7⅜	5¾	8½	5¼	13	6½	800	1,900	Heyden Chemical Corp.	10	150,000				
2¼	2¼	2¼	2⅞	2¼	3⅛	2⅜	100	200	Imperial Chem. Ind.	1£				1.21	
...	...	...	...	...	...	...			Monroe Chem.	No	126,000				
...	...	...	...	...	60	20			Shawinigan W. & P.	No	2,178,000	2.50			
24	29½	22½	32½	22½	66⅛	34½	1,750	2,625	Sherwin-Williams Co.	25	636,000	4.00	Yr. Aug. '30		4.14
⅜	¾	½	1¼	½	12	⅜	1,100		Silica Gel Corp.	No	600,000				
15⅞	16¾	13¼	...	...	38⅛	13½	147,400	147,400	Standard Oil Ind.	25	16,851,000	2.50			2.73
14⅝	17⅛	14¼	18⅞	14¼	30⅜	14⅜	10,650	55,050	Swift & Co.	25	6,000,000	2.00			2.08
2	3	1⅞	5¼	1½	16	1½	10,900	36,700	Tubize "B"	No	600,000	10.00			
...	...	...	...	...					United Chemicals						
...	12½	11⅜	16¼	11½	...	...	500	2,600	$3 cum. part. pfd.	No	115,000	3.00			

CLEVELAND

...	...	...	27	27	...	...			Cleve-Cliffs Iron, $5 pfd	No	498,000	5.00			11.42
27	32	25	36	25	51½	30	1,731	4,591	Dow Chemical Co.	No	630,000	2.00			3.44
25	29	23	35	23	68½	33⅞	3,015	10,350	Sherwin-Williams Co.	25	636,000	4.00	Yr. Aug. '30		4.14

CHICAGO

24½	27	23¾	31¾	23¾	39⅞	26½	1,950	3,650	Abbott Labs	No	145,000	2.50			3.32
3	3	3	4	3	5½	3	150	490	Monroe Chem.	No	126,000			1.21	1.09
21	25	21	32½	21	33	24	130	1,020	$3.50 cum. pref.	No	30,000	3.50			
15⅝	17¼	14⅛	19	14⅛	30½	16½	29,800	85,500	Swift & Co.	25	6,000,000	2.00			2.08

CINCINNATI

32	34	25¼	42¾	25¼	71	36⅞	27,935	55,355	Procter & Gamble	No	6,410,000	2.40	Yr. Je. '30		3.36

PHILADELPHIA

...	...	...	35	35	75	37½		100	Pennsylvania Salt	50	150,000	5.00	Yr. Je. '30		7.97

The Industry's Bonds

1932 Apr. Last	1932 Apr. High	1932 Apr. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Apr.	Sales During 1932	ISSUE	Date Due	Int. %	Int. Period	Outstanding $
									NEW YORK STOCK EXCHANGE				
74	78	75	80	69	99	69¼	6	40	Amer. Cyan. deb. 5s	1942	5	A. O.	4,554,000
58½	69	55	70½	55	102	52	304	1,078	Amer. I. G. Chem. conv. 5½s	1949	5½	M. N.	29,933,000
83¼	101¾	80	101¾	80	104½	85¾	348	1,166	Am. Smelt & Ref. 1st. 5s. "A"	1947	5	A. O.	36,578,000
...	10	2	12½	2	63½	7½	64	288	Anglo-Chilean s. f. deb. 7s	1945	7	M. N.	14,600,000
95⅛	95⅛	92	95⅛	85⅛	103	89	55	239	Atlantic Refin. deb. 5s	1937	5	J. J.	14,000,000
40	55	49⅞	60	49⅞	104	59	45	54	Interlake Iron Corp. 1st 5½s "A"	1945	5½	M. N.	6,629,000
103¼	103¼	101⅝	103¼	100⅝	105⅜	100	29	87	Corn Prod. Refin. 1st s. f. 5s	1934	5	M. N.	1,822,000
3¾	11¼	3¾	14½	3¾	75½	6	210	1,370	Lautaro Nitrate conv. 6s	1954	6	J. J.	32,000,000
74¼	75	65½	76	65½	96	67¾	202	409	Pure Oil s. f. 5½% notes	1937	5½	F. A.	17,500,000
72½	85	72½	89	72½	103	80	110	410	Solvay Am. Invest. 5% notes	1942	5	M. S.	15,000,000
101⅝	102	100⅝	102	99½	105½	98¼	968	4,081	Standard Oil, N. J. deb. 5s	1946	5	F. A.	120,000,000
91	91⅞	88⅛	93⅞	87	106½	85	371	892	Standard Oil, N. Y. deb. 4½s	1951	4½	J. D.	50,000,000
60	63	55	83	50	99	45	15	368	Tenn. Corporation deb. 6s. "B"	1944	6	M. S.	3,308,000
									NEW YORK CURB				
86	94¾	86	98⅞	86	105½	93⅛	288,000	1,125,000	Aluminum Co., s. f. deb. 5s	1952	5	M. S.	37,115,000
62¾	72	62⅝	74	62⅝	104¾	66	105,000	244,000	Aluminum Ltd., 5s	1948	5	J. J.	20,000,000
...	16¾	15½	22	15	56	10	13,000	50,000	Amer. Solv. & Chem. 6½s	1936	6½	M. S.	1,737,000
25	25	24	25	24	43	29	3,000	9,000	General Rayon 6s. "A"	1948	6	J. D.	5,085,000
93	95½	91½	96	91½	103⅛	40½	183,000	741,000	Gulf Oil, 5s	1937	5	J. D.	30,414,000
92½	93½	91	95½	91	104	74	185,000	684,000	Sinking Fund deb. 5s	1947	5	F. A.	35,000,000
70¾	84⅜	65	88	64	102⅞	66	465,000	1,004,000	Koppers G. & C. deb. 5s	1947	5	J. D.	23,050,000
65½	70	62	76	62	98⅜	56	262,000	882,000	Shawinigan W. & P. 4½s. "A"	1967	4½	A. O.	35,000,000
65½	69½	62	76	62	98½	58	130,000	418,000	4½s., series "B"	1968	4½	M. N.	16,108,000
100	100½	99½	100¾	98½	104	99⅞	129,000	484,000	Swift & Co., 5s	1944	5	J. J.	22,916,000
...	101½	101½	101½	99	104½	95	114,000	205,000	Westvaco Chlorine Prod. 5½s	1937	5½	M. S.	1,992,000

Chemical Exports and Imports

U. S. Chemical Export Figures for February

ARTICLES, AND COUNTRIES TO WHICH EXPORTED	UNIT OF QUANTITY	FEBRUARY—				TWO MONTHS ENDING FEBRUARY—			
		1931		1932		1931		1932	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
GROUP 8.—CHEMICALS AND RELATED PRODUCTS			$8, 100, 622		$6, 450, 648		$17, 002, 653		$12, 910, 237
A. COAL-TAR-PRODUCTS			701, 326		683, 762		1, 904, 592		1, 348, 113
Benzol	Gal	699, 829	106, 151	116, 003	16, 389	3, 676, 342	701, 592	127, 324	20, 972
Crude coal tar	Bbl [1]	2, 146	9, 290	694	2, 250	4, 275	17, 704	60, 691	142, 218
Coal-tar pitch	Ton	246	6, 710	23, 004	196, 794	7, 811	75, 310	27, 404	238, 427
Creosote oil	Gal	15, 862	4, 543	889	198	16, 464	4, 778	2, 055	507
Coal-tar colors, dyes, stains, and color lakes	Lb	2, 537, 587	528, 707	1, 264, 055	393, 493	4, 603, 622	988, 201	3, 018, 196	804, 836
Other coal-tar products, exclusive of medicinals	Lb	568, 162	50, 925	344, 048	74, 638	1, 270, 288	117, 007	856, 419	141, 153
C. INDUSTRIAL CHEMICAL SPECIALTIES			1, 068, 044		855, 290		2, 115, 533		1, 614, 930
Nicotine sulphate (40% basis)	Lb	64, 603	33, 423	13, 467	8, 441	108, 362	76, 596	19, 228	13, 834
Lead arsenate	Lb	344, 891	36, 583	70, 787	5, 883	505, 426	53, 794	88, 071	8, 459
Calcium arsenate	Lb	157, 360	8, 580	196, 336	8, 840	299, 640	16, 087	596, 236	23, 981
Other agricultural insecticides, fungicides, and similar preparations and materials	Lb	489, 820	73, 378	389, 301	34, 651	1, 118, 083	120, 876	697, 527	58, 225
Household insecticides and exterminators	Lb	682, 216	187, 313			1, 076, 022	314, 425		
Liquid	Lb			330, 320	90, 143			485, 733	134, 868
Powdered or paste	Lb			51, 112	13, 174			89, 335	25, 735
Household disinfectants, deodorants, germicides, and similar preparations	Lb	276, 343	41, 685	85, 441	14, 235	487, 717	73, 157	225, 158	25, 784
D. INDUSTRIAL CHEMICALS			1, 528, 254		1, 243, 511		3, 199, 802		2, 711, 312
Acids and anhydrides—									
Organic (exclusive of coal-tar acids)	Lb	44, 491	10, 038	39, 148	10, 716	58, 046	13, 862	97, 580	16, 107
Inorganic—									
Nitric	Lb	30, 609	3, 453	35, 873	4, 424	41, 874	4, 815	47, 657	5, 800
Sulphuric	Lb	374, 784	6, 747	188, 887	4, 438	679, 529	12, 219	537, 987	9, 724
Hydrochloric (muriatic)	Lb	815, 302	13, 370	724, 871	11, 743	1, 474, 695	22, 507	1, 650, 590	24, 238
Boric (boracic)	Lb	149, 666	8, 194	268, 943	12, 321	481, 407	25, 769	494, 900	24, 563
Other inorganic acids and anhydrides	Lb	461, 119	29, 957	693, 611	20, 284	607, 880	40, 762	1, 378, 290	45, 293
Alcohols—									
Methanol	Gal	18, 295	$8, 761	39, 434	$16, 092	63, 434	$31, 730	76, 087	$34, 598
Glycerol (gylcerin)	Lb	17, 705	2, 596	17, 266	2, 017	49, 577	6, 842	38, 573	4, 489
Butanol (butyl alcohol)	Lb	156, 023	18, 967	110, 749	13, 050	226, 803	28, 978	126, 211	15, 612
Other alcohols	Lb	8, 867	992	73, 615	12, 915	18, 568	3, 359	219, 806	26, 843
Acetone	Lb	305, 208	27, 409	382, 786	26, 629	529, 574	46, 966	993, 728	69, 188
Carbon tetrachloride	Lb	36, 416	2, 728	98, 903	4, 378	81, 682	4, 522	131, 524	6, 045
Carbon bisulphide	Lb	176, 293	14, 252	221, 163	13, 711	263, 014	19, 395	418, 378	26, 225
Formaldehyde (formalin)	Lb	386, 206	23, 244	368, 202	17, 174	612, 734	36, 978	636, 815	31, 339
Ethylene compounds	Lb	52, 884	13, 107	59, 410	8, 994	101, 726	22, 636	100, 606	15, 917
Citrate of lime	Lb	232, 724	30, 000	686, 982	72, 500	498, 724	64, 000	1, 390, 602	143, 775
Other synthetic organic products	Lb	98, 096	16, 671	196, 850	35, 171	238, 211	37, 752	367, 213	64, 120
Nitro or aceto cellulose solutions, collodion, etc	Lb	115, 590	28, 838	224, 455	40, 021	251, 396	68, 861	351, 424	64, 099
Ammonium compounds (except sulphate, phosphate, and anhydrous ammonia)	Lb	143, 161	7, 820	37, 003	3, 022	237, 589	13, 689	75, 284	6, 076
Aluminum sulphate	Lb	3, 358, 906	37, 173	3, 005, 949	32, 849	7, 598, 758	86, 436	5, 965, 330	64, 801
Other aluminum compounds	Lb	175, 232	18, 483	112, 544	11, 098	483, 594	47, 289	164, 898	14, 039
Calcium compounds—									
Carbide	Lb	139, 750	6, 436	256, 843	9, 990	270, 717	13, 261	613, 390	23, 758
Chlorinated lime (bleaching powder)	Lb	115, 720	5, 172	98, 435	5, 205	210, 470	9, 495	181, 051	7, 963
Chloride	Lb	855, 336	11, 400	572, 753	6, 306	1, 951, 034	24, 704	921, 836	9, 957
Other, except arsenate, cyanide, and nitrate	Lb	20, 474	989	21, 241	2, 387	177, 408	8, 999	178, 141	12, 007
Copper sulphate (blue vitriol)	Lb	950, 586	37, 483	270, 420	8, 272	1, 932, 340	77, 092	792, 049	24, 154
Hydrogen peroxide (or dioxide)	Lb	130, 759	23, 021	32, 065	4, 740	230, 926	41, 451	97, 364	14, 105
Potassium compounds (not fertilizers)	Lb	138, 532	21, 588	87, 936	16, 790	244, 531	41, 012	228, 780	46, 641
Sodium compounds	Lb	36, 513, 591	810, 868	30, 840, 952	609, 051	76, 238, 990	1, 695, 365	72, 860, 031	1, 427, 506
Bichromate and chromate	Lb	240, 291	16, 156	391, 719	20, 148	507, 433	32, 340	1, 121, 924	63, 130
Cyanide	Lb	154, 955	23, 759	81, 386	9, 983	228, 108	36, 225	139, 637	19, 384
Borate (borax)	Lb	12, 255, 549	277, 981	12, 029, 580	222, 086	26, 426, 329	636, 587	32, 796, 816	592, 340
Silicate (water glass)	Lb	3, 931, 271	40, 940	4, 513, 876	36, 739	8, 905, 244	82, 547	9, 555, 416	78, 303
Soda ash	Lb	3, 974, 852	63, 072	1, 833, 442	36, 644	9, 246, 830	144, 230	3, 81[illegible], 435	68, 244
Sal soda	Lb	549, 130	7, 120	382, 385	5, 503	1, 422, 454	18, 055	1, 060, 090	16, 253
Bicarbonate (acid soda or baking soda)	Lb	1, 550, 137	30, 046	1, 284, 142	24, 331	3, 308, 761	63, 356	2, 530, 144	47, 754
Sulphate	Lb	850, 797	8, 799	34, 280	772	1, 307, 944	14, 294	82, 356	2, 055
Bisulphate (niter cake)	Lb	1, 773, 511	10, 911	40, 783	92	2, 615, 342	17, 085	178, 966	757
Hydroxide (caustic soda)	Lb	10, 084, 253	281, 841	9, 230, 386	211, 502	19, 837, 399	552, 447	19, 723, 580	458, 523
Sulphide	Lb	34, 583	2, 359	18, 129	629	194, 102	5, 786	83, 772	2, 289
Fluorides	Lb	2, 100	47	2, 063	223	2, 425	81	43, 043	3, 537
Sodium phosphate (mono, di or tri)	Lb	620, 806	19, 071	653, 883	17, 464	944, 436	30, 052	935, 139	25, 834
Other sodium compounds	Lb	491, 356	28, 766	344, 898	22, 935	1, 292, 183	62, 280	792, 713	49, 103
Tin compounds	Lb	53, 138	9, 788	101, 368	15, 588	141, 002	25, 323	115, 980	19, 169
Zinc compounds	Lb	204, 217	6, 533	60, 124	3, 553	310, 410	12, 184	83, 642	6, 442
Gases, compressed, liquefied, and solidified—									
Ammonia, anhydrous	Lb	266, 862	28, 511	74, 593	9, 746	414, 876	51, 598	284, 561	36, 209
Chlorine	Lb	682, 912	17, 916	979, 494	25, 250	1, 627, 853	58, 628	1, 535, 209	39, 618
Other gases, n. e. s	Lb	173, 078	27, 061	341, 356	29, 573	327, 767	57, 590	468, 304	50, 221
Other industrial chemicals			198, 688		123, 513		443, 733		280, 671
E. PIGMENTS, PAINTS, AND VARNISHES			1, 120, 409		850, 945		2, 652, 616		1, 800, 349
Mineral-earth pigments—									
Ocher, umber, sienna, and other forms of iron oxide for paints	Lb	633, 580	15, 892	1, 005, 130	24, 818	1, 391, 416	36, 687	1, 479, 797	36, 355
Other mineral-earth pigments (whiting, barytes, etc.)	Lb	1, 406, 120	21, 519	479, 982	6, 701	2, 181, 212	34, 752	1, 220, 071	16, 177

ARTICLES, AND COUNTRIES TO WHICH EXPORTED	UNIT OF QUANTITY	FEBRUARY— 1931 Quantity	FEBRUARY— 1931 Value	FEBRUARY— 1932 Quantity	FEBRUARY— 1932 Value	TWO MONTHS ENDING FEBRUARY— 1931 Quantity	TWO MONTHS ENDING FEBRUARY— 1931 Value	TWO MONTHS ENDING FEBRUARY— 1932 Quantity	TWO MONTHS ENDING FEBRUARY— 1932 Value
Chemical pigments—									
Zinc oxide	Lb	1,080,626	77,065	311,226	23,298	2,314,728	164,395	705,621	51,819
Lithopone	Lb	704,194	31,465	1,048,825	43,187	1,316,599	58,425	1,525,928	63,846
Bone black and lampblack	Lb	210,218	10,196	130,653	8,034	441,296	20,776	190,230	13,097
Carbon black or gas black	Lb	5,380,509	304,987	6,382,126	299,977	14,200,536	876,246	14,582,445	692,134
Red lead, litharge, and orange mineral	Lb	315,163	19,830			942,623	65,505		
Red Lead	Lb			53,029	3,139			129,214	8,661
Litharge	Lb			302,917	14,611			457,753	22,622
White lead	Lb	840,967	49,161			2,001,918	118,712		
Dry	Lb			591,623	25,915			1,506,797	69,345
In oil	Lb			9,299	843			109,726	9,989
Other chemical pigments	Lb	519,498	49,792	456,190	54,140	1,046,078	110,235	790,266	102,603
Bituminous paints, liquid and plastic			29,114		22,073		70,793		29,711
Paste paint	Lb	215,512	32,951	122,508	29,830	490,566	68,852	272,560	56,161
Kalsomine or cold-water paints, dry	Lb	446,053	24,645	477,289	24,675	1,044,419	53,833	1,009,873	53,255
Nitrocellulose (pyroxylin) lacquers—									
Pigmented	Gal	17,986	57,832	20,751	56,948	39,971	124,435	40,775	108,982
Clear	Gal	7,235	16,725	7,038	15,166	17,302	41,233	13,472	27,926
Thinners for nitrocellulose lacquers	Gal	29,742	36,678	14,480	18,121	48,187	62,001	34,402	40,384
Ready-mixed paints, stains, and enamels	Gal	149,964	296,521	80,118	155,145	315,156	645,571	168,869	336,879
Varnishes (oil or spirit, and liquid dryers)	Gal	29,502	43,196	19,377	22,962	70,209	95,313	48,499	57,880
Paint and varnish removers	Gal	1,845	2,840	814	1,362	3,507	4,852	1,756	2,523
F. FERTILIZERS AND FERTILIZER MATERIALS	Ton	103,971	1,307,006	98,264	1,254,623	198,067	2,351,453	177,606	2,149,669
Nitrogenous fertilizer materials—									
Ammonium sulphate	Ton	12,177	407,317	2,237	62,778	24,542	794,291	9,962	290,142
Other nitrogenous chemical materials	Ton	5,532	258,643	29,632	838,304	6,327	285,062	41,545	1,163,291
Nitrogenous organic waste materials	Ton	602	22,409	245	5,022	773	25,449	307	5,904
Phosphatic fertilizer materials—									
Phosphate rock—									
High-grade hard rock	Ton	27	330	9,793	55,009	255	2,913	20,828	116,854
Land pebble	Ton	74,147	325,689	55,131	243,619	141,938	601,078	99,368	429,967
Superphosphate (acid phosphate)	Ton	6,314	71,514	141	6,500	11,815	134,438	2,940	39,112
Other phosphate materials	Ton	208	7,780	197	8,499	1,841	68,911	326	14,666
Potassic fertilizer materials—									
Potassium chloride or muriate	Ton	1,420	64,205			2,715	122,791		
Other potash fertilizers	Ton	10	558	54	2,980	601	21,364	55	3,061
Concentrated chemical fertilizers—									
Nitrogenous phosphatic types	Ton	3,052	$132,014	701	$27,052	6,283	$263,634	2,120	$80,854
Nitrogenous phosphatic potassic types	Ton	20	554			20	554		
Prepared fertilizer mixtures	Ton	462	15,993	133	4,860	957	30,968	155	5,818

U. S. Chemical Import Figures for February

ARTICLES, AND COUNTRIES FROM WHICH IMPORTED	UNIT OF QUANTITY	FEBRUARY— 1931 Quantity	FEBRUARY— 1931 Value	FEBRUARY— 1932 Quantity	FEBRUARY— 1932 Value	TWO MONTHS ENDING FEBRUARY— 1931 Quantity	TWO MONTHS ENDING FEBRUARY— 1931 Value	TWO MONTHS ENDING FEBRUARY— 1932 Quantity	TWO MONTHS ENDING FEBRUARY— 1932 Value
GROUP 8.—CHEMICALS AND RELATED PRODUCTS			7,562,371		4,455,675		14,728,670		9,246,678
A. COAL-TAR PRODUCTS			866,066		724,039		1,661,857		1,439,959
Crude—									
Dead or creosote oil ... free	Gal	3,746,232	351,507	432,908	58,474	7,366,192	725,715	3,646,271	363,074
All other ... free			54,775		76,832		126,034		126,318
Intermediates—									
Acids ... dut	Lb			98,106	29,964	160,756	10,749	126,979	79,386
All other ... dut	Lb	61,758	27,552	92,616	56,754	145,558	62,737	143,750	80,621
Finished products—									
Colors, dyes, stains, color acids, and color bases, n. e. s. ... dut	Lb	342,821	398,811	395,660	442,033	560,280	657,079	639,414	715,779
Belgium	Lb	991	1,217	3,008	2,515	6,375	7,221	5,105	4,870
France	Lb	1,984	7,169	7	15	4,728	11,942	63	143
Germany	Lb	170,452	192,028	245,936	287,867	337,507	382,899	371,748	424,024
Italy	Lb	6,380	5,896			10,878	10,044	1,133	1,384
Switzerland	Lb	152,929	181,136	128,249	132,055	185,548	226,333	230,160	251,823
United Kingdom	Lb	6,394	7,195	16,264	17,521	9,151	10,700	27,710	30,135
Coal-tar medicinals ... dut	Lb	1,801	6,615	2,149	14,125	10,340	33,149	3,661	23,992
Other finished coal-tar products ... dut	Lb	8,820	26,806	12,215	45,857	14,831	46,394	14,600	50,789
B. MEDICINAL AND PHARMACEUTICAL PREPARATIONS			404,294		291,452		801,253		587,069
Quinine sulphate ... free	Oz	66,000	22,903	128,700	43,304	176,000	62,841	140,700	47,233
Other quinine and other akaloid and salts from cinchona bark ... free	Oz	5,312	1,209	10,032	1,741	8,792	3,001	92,032	21,129
Other alkaloids, salts, and derivatives ... dut			10,957		4,682		23,065		12,625
Antitoxins, serums, vaccines, etc., and blistering beetles ... free			1,536				1,536		114
Menthol ... dut	Lb	43,020	119,488	38,760	86,111	69,665	196,952	71,640	164,607
Santonin and salts ... free	Lb	110	11,157			122	12,763		
Other medicinals ... dut			14,358		5,101		30,012		9,622
All other preparations, n .e. s ... dut			222,686		150,513		471,083		331,739
D. INDUSTRIAL CHEMICALS			1,311,603		1,413,799		2,612,936		2,663,973
Acetylene, butylene, ethylene, and propylene derivatives ... dut	Lb	39,788	9,644	30,677	2,559	56,727	11,579	47,587	4,566
Acids and anhydrides—									
Acetic or pyroligneous ... dut	Lb	1,466,860	77,617	1,326,906	63,647	2,325,860	119,775	1,991,976	99,671
Arsenious (white arsenic) ... free	Lb	1,169,498	33,846	1,325,444	35,919	1,795,700	54,725	2,056,163	54,498
Formic ... dut	Lb	11,111	889			11,111	889	11,134	623
Oxalic ... dut	Lb	42,968	2,268	68,082	3,632	79,624	4,190	94,660	5,081
Sulphuric (oil of vitriol) ... free	Lb			61,800	618			163,200	1,277
Tartaric ... dut	Lb	338,691	74,915	128,720	21,665	470,291	105,081	470,180	83,219
All other ... free	Lb			100	114	63,307	2,927	100	114
All other ... dut	Lb	79,130	16,741	134,037	12,074	115,574	23,357	150,181	14,934
Alcohols, n. e. s., including fusel oil ... dut			506		94		1,137		273

U. S. Chemical Import Figures (*Continued*)

ARTICLES, AND COUNTRIES FROM WHICH IMPORTED	UNIT OF QUANTITY	FEBRUARY				TWO MONTHS ENDING FEBRUARY—			
		1931		1932		1931		1932	
		Quantity	*Value*	*Quantity*	*Value*	*Quantity*	*Value*	*Quantity*	*Value*
Ammonium compounds, n. e. s.—									
Chloride (muriate)........dut..	Lb......	449,822	12,233	774,460	17,612	1,075,326	31,224	1,180,193	28,574
Nitrate........dut..	Lb......	485,788	13,847	549,382	13,890	1,025,090	30,131	1,151,777	30,240
All other........dut..	Lb......	64,717	4,264	16,781	997	121,509	7,296	25,573	1,546
Barium compounds........dut..	Lb......	708,394	14,916	75,749	2,075	1,009,872	19,370	195,385	4,044
Calcium compounds........dut..	Lb......	78,720	3,180			158,720	6,180		
Cellulose products, n. e. s.—									
Acetate........dut..	Lb......	2,428	3,721			2,955	4,298	477	520
All other—									
Sheets more than 3/1000-inch thick, and other forms........dut..	Lb......	15,743	13,079	6,390	4,240	23,008	29,454	21,756	11,471
Sheets and strips, more than 1 inch wide, not over 3/1000-inch thick........dut..	Lb......	13,295	6,420	1,783	1,195	19,291	8,971	7,596	5,533
Cobalt oxide........dut..	Lb......	4,000	$6,692	21,036	$20,767	21,980	$36,857	36,751	$37,438
Copper sulphate (blue vitriol)........free..	Lb......	426,858	17,895	383,834	10,701	687,360	28,207	2,131,161	57,026
Glycerin—									
Crude........dut..	Lb......	625,932	36,908	289,547	12,268	1,851,887	107,711	1,095,631	47,796
Refined........dut..	Lb......	128,731	10,074	138,835	9,885	386,613	33,898	259,281	17,964
Iodine, crude........free..	Lb......	28,981	106,368	32,042	106,648	59,196	220,351	49,990	166,392
Lime, chlorinated, or bleaching powder..dut..	Lb......	85,951	2,514	122,216	3,313	244,691	7,610	284,673	7,080
Magnesium compounds........dut..	Lb......	846,830	21,726	818,372	15,586	1,671,398	35,545	1,613,252	23,772
Potassium compounds, n. e. s.—									
Argols, tartar, and wine lees........free..	Lb......	1,069,991	94,927	1,122,344	64,833	2,457,705	221,017	2,635,025	146,538
Carbonate........dut..	Lb......	1,237,442	58,217	744,082	30,261	1,753,338	82,800	1,484,487	59,505
Chlorate and perchlorate........dut..	Lb......	1,425,521	49,915	820,883	29,469	3,178,884	112,253	1,486,500	54,038
Cream of tartar........dut..	Lb......					36,400	6,676	5,500	705
Cyanide........free..	Lb......	2,645	920	1,653	607	4,298	1,467	1,653	607
Hydroxide (caustic potash)........dut..	Lb......	433,110	21,752	392,429	23,584	976,350	48,320	872,930	47,255
Nitrate crude (saltpeter)........free..	Ton......	2,191	84,884	3,680	212,537	3,500	146,498	5,789	292,546
Other potassium compounds, n. e. s...dut..	Lb......	760,508	32,920	333,289	25,024	1,106,924	48,255	613,313	39,647
Sodium compounds, n. e. s.—									
Sulphate crude (salt cake)........free..	Lb......	13,560,535	80,786	8,402,194	44,750	25,326,946	140,115	22,547,539	123,841
Cyanide........free..	Lb......	765,115	55,347	1,864,378	159,087	1,781,315	133,007	3,260,217	305,298
Ferrocyanide (yellow prussiate)........dut..	Lb......	80,825	6,918	22,428	1,924	232,703	19,590	72,918	6,203
Nitrate........dut..	Lb......			300	55			300	55
Phosphate (except pyrophosphate)....dut..	Lb......	61,323	953	11,883	284	249,487	3,959	14,088	345
Other sodium compounds, n. e. s.....free..	Lb......	19,786	2,111			19,962	2,144		
Other sodium compounds, n. e. s.....dut..			53,923		43,518		107,432		78,045
Radium salts........free..	Grain...	4	17,414	36	122,813	4	17,414	36	123,513
Other industrial chemicals........free..			132,743		116,431		298,545		355,110
Other industrial chemicals........dut..			127,610		179,123		292,681		327,070
E. PIGMENTS, PAINTS, AND VARNISHES........			156,065		156,617		286,596		278,074
Mineral-earth pigments—									
Iron oxide and iron hydroxide........dut..	Lb......	755,481	17,565	838,199	13,827	1,189,083	32,606	1,468,801	29,510
Ochers and siennas........dut..	Lb......	729,414	11,105	698,980	9,274	1,536,731	29,956	1,390,494	20,951
Other mineral-earth pigments........dut..			21,553		4,136		67,029		11,124
Chemical pigments—									
Lithopone and zinc pigments, n. e. s...dut..	Lb......	1,702,400	64,864	1,579,023	47,809	1,702,400	64,864	2,713,023	80,031
Zinc oxide and leaded zinc oxide........dut..	Lb......	184,282	12,321	734,161	37,147	356,746	25,595	1,282,857	62,715
Other chemical pigments........dut..	Lb......	216,298	15,089	298,208	30,013	395,859	30,169	552,807	45,708
Paints, stains, and enamels........dut..			11,411		11,742		30,207		23,772
Varnishes........dut..	Gal......	684	2,157	1,394	2,669	3,224	6,170	2,164	4,263
F FERTILIZERS AND MATERIALS........	Ton......	138,970	4,596,122	82,221	1,680,702	273,960	8,930,660	169,325	3,943,865
Nitrogenous—									
Ammonium sulphate........free..	Ton......	4,920	176,184	19,232	439,916	18,662	690,974	38,419	875,606
Ammonium-sulphate-nitrate........free..	Ton......	133	7,204			944	43,324	75	3,734
Calcium cyanamide or lime nitrogen...free..	Ton......	8,341	273,030	6,252	154,745	13,508	439,603	11,442	267,841
Calcium nitrate........free..	Ton......	7,242	240,616	1,133	27,771	11,815	387,974	2,562	65,836
Guano........free..	Ton......	2,454	78,374	24	349	4,068	140,012	3,233	52,479
Dried blood........free..	Ton......	839	39,793	425	11,452	1,657	83,992	1,133	31,018
Sodium nitrate........free..	Ton......	68,421	2,628,427	8,404	197,772	114,261	4,347,593	42,541	1,243,962
Urea and calurea........free..	Ton......	644	51,575	579	44,138	1,885	156,232	1,525	111,707
Other nitrogenous........free..	Ton......	3,050	78,892	2,144	38,070	9,528	237,255	2,361	43,824
Phosphates—									
Bone, ash, dust, and meal, and animal carbon fertilizers........free..	Ton......	3,652	85,934	3,698	65,425	9,931	238,907	7,368	139,703
Other phosphate materials........free..	Ton......	74	1,323	1,657	21,480	74	1,323	3,504	46,122
Potash fertilizers—									
Chloride, crude (muriate)........free..	Ton......	11,455	442,018	6,313	228,124	27,334	1,032,048	10,603	394,069
Kainite........free..	Ton......	6,956	59,465	7,846	69,969	15,302	137,845	10,157	88,530
Manure salts........free..	Ton......	12,209	169,059	19,484	237,812	26,105	406,171	23,142	283,706
Sulphate, crude........free..	Ton......	3,196	145,772	2,039	89,807	6,710	309,061	4,025	179,667
Other potash-bearing substances........free..	Ton......	6	36	47	369	34	219	47	369
Fertilizers, compounded or chemically combined, containing nitrogen, phosphoric acid and potash........free..	Ton......	1,329	77,081	421	20,742	2,829	167,488	528	26,742
All other........free..	Ton......	4,049	41,339	2,523	32,761	9,313	110,639	6,660	88,900
G. EXPLOSIVES........			11,430		3,914		21,814		8,117
Powder and other explosives, n. e. s......dut..			6,099				6,175		46
Firecrackers........dut..	Lb......	24,165	2,877	22,468	2,945	38,341	4,860	39,993	4,922
Fireworks and ammunition........dut..			2,454		969		10,779		3,149
H. SOAP AND TOILET PREPARATIONS........			211,086		178,844		407,761		314,497
Soap—									
Castile........dut..	Lb......	262,943	21,838	178,428	15,826	526,224	49,360	389,527	34,477
Toilet........dut..	Lb......	128,597	35,409	102,185	25,857	196,519	54,000	140,651	37,316
All other........dut..	Lb......	119,205	14,233	153,344	13,962	220,971	27,076	340,659	25,570
Perfume materials........free..	Lb......	902	34,784	806	33,824	1,326	61,698	1,031	50,610
Perfume materials........dut..			52,487		54,238		98,482		96,376
Perfumery, bay rum, and toilet water...dut..			26,532		12,368		65,163		32,106
Bath salts........dut..	Lb......	3,783	592	810	119	4,792	846	1,475	284
Cosmetics, powders, creams, etc........dut..			25,211		22,650		51,136		37,758
I. ARTICLES IN GROUP 8, ORDINARILY DUTIABLE, IMPORTED FREE........free..			5,705		6,308		5,793		11,124

Compiled from Monthly Summary of Foreign Trade of the United States, of the Dept. of Commerce

The Trend of Prices

Business continues at slow pace. Prices show much firmer tendencies. Chemical Markets' Average Price holds at last month's level. N. Y. Journal of Commerce chemical index of prices advances slightly, Annalist chemical index is slightly lower, while fats and oils, chemicals and drugs, and mixed fertilizer groups of the National Fertilizer Association indices are lower and fertilizer materials higher.

Improvement in the volume of chemical business looked for in April failed to materialize. The level of activity remained about the same as in March. Fertilizer tag sales were only about 48 per cent of the previous year and this was a very important contributing factor in the drop in carloadings in the chemical and fertilizer group when comparison is made with 1931.

Firmer Prices

The bright spot in the picture was the comparative firmness in the price structure. Nevertheless several important reductions were announced. Carbon black producers lowered the price of Texas gas black in bulk ¼ cent, the new quotation being 2¾ cents per pound. As a result of a further decline in the tin market both the crystals and the tetrachloride were reduced. Glycerine continued to show extremely poor resistance to further pressure for lower prices, while producers of butyl alcohol, butyl acetate and butyl stearate made sizable concessions. An unexpected decline was that made in yellow prussiate. The new price is 16½ cents against a former 18 cent level. An increase in imports was said to be the main factor changing this market which has been one of the most stable in the long list of important industrial chemicals. With no change in the paper and glass industries salt cake producers found it necessary to reduce the price $1 a ton.

Prominent in the much smaller list of advances were domestic ammonium sulfate, sodium silicofluoride and the various grades of carnauba wax. With the mixing season practically at an end the change in ammonium sulfate will not seriously effect the fertilizer situation.

The glass, paper, and leather industries are still operating at very reduced schedules. Improvement is apparent in the seasonal industries and in chemicals consumed in these fields. Copper sulfate producers report a pick-up in shipments into the agricultural sections, actual shipping orders for calcium chloride for dust-laying purposes have been received, anhydrous ammonia is moving out in better volume, insecticide, fungicide, and disinfectant manufacturers are making preparations for the season at hand. Despite better demand the keen competitive position between domestic producers and importers of tartaric acid resulted in a reduction in price. Citric acid was also reduced at the beginning of the month.

Coal-Tar Chemicals

The situation in coal-tar chemicals remained unchanged. The low rate of activity in the steel industry has prevented accumulations of stock in most items. The scarcity of toluene continued. The demand for colors was about the same as in March. Further firmness appeared in the local and primary rosin markets, but turpentine was unable to hold all of the recent gains and declined moderately. The downward trend in fats and oils was unchecked. Shellac went lower.

General Business

Retail trade was better in April under the stimulus of more seasonable weather. Inventories in the hands of dealers are small, and should the present modest improvement continue, it will not be long before it is reflected in jobbers' and manufacturers' orders. The automobile industry expanded operations slightly and May schedules are larger than April. Steel demand increased slightly. In sympathy with the depreciation in stocks most commodity markets were lower. The Washington situation is the principle deterrent to any change for the better. It is expected that the present session will end before June 1. Should the budget be balanced and the Hoover economy program receive proper consideration, it is thought that the way will be clear for a change of sizable proportions.

Activity Measured

The N. Y. Times index of business activity continued to go lower throughout

N. Y. Times Index of Business

the month due mainly to a sharp decrease in carloadings and electrical consumption.

The following table gives the combined index and its components, each of which is adjusted for seasonal variation and where necessary for long-time trend:

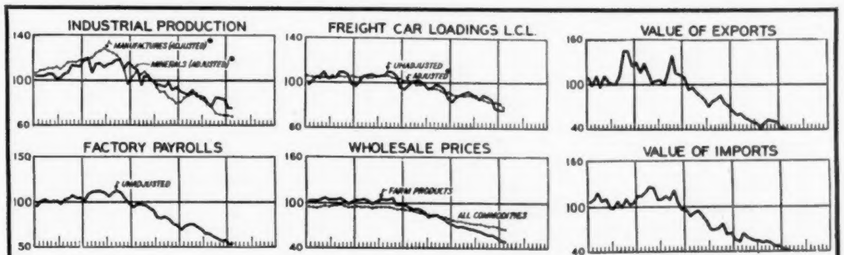
	Week Ended Apr. 23 1932	Apr. 16 1932	Apr. 25 1931
Freight car loadings	*58.9	60.8	79.9
Steel mill activity	24.2	23.2	54.8
Electric power production	70.8	71.8	86.9
Automobile production	33.5	32.6	68.1
Carded cotton cloth prod.	75.4	87.3	93.8
Combined index	*58.4	59.7	79.4

*Subject to Revision.

Indices of Business

	Latest Available Month	Previous Month	Year Ago
Automobile Production, March	118,959	117,418	276,405
†Brokers Loans, April	$533	$524	$1,908
*Building Contracts, March	$112,234	$89,045	$370,406
*Car Loadings, April 16	566	544	759
†Commercial Paper, March 31	$105	$103	$311
Payrolls, Feb.	53.6	52.4	73.2
*Mail Order Sales, Feb.	$32,581	$31,975	$39,422
Failures, Dun, March	$93,760	$84,900	$60,386
*Merchandise Imports, March	$131,000	$131,000	$210,202
*Merchandise Exports, March	$156,000	$155,000	$235,899
Furnaces in Blast, April 1	21.1	22.5	37.0
*Steel Orders, March 31	2,472	2,545	3,995

*000 omitted. †000,000 omitted.



Charts cover years 1928, 1929, 1930, 1931, 1932; 1923-1925=100. Dept. of Commerce.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

Important Price Changes

Advances	Apr.	Mar.
Ammonium Sulfate	$26.00	$22.00

Declines

Acid, tartaric	.24	.24½
Butyl Alcohol, tanks	.113	.123
Butyl Acetate, tanks	.124	.143
Butyl Stearate	.25	.25½
Dibutyl phthalate	.218	.23½
Glycerine, dynamite	.075	.08
Glycerine, saponification	.045	.05
Glycerine, soap lye	.0375	.04
Mercury metal	68.00	74.50
Yellow prussiate	.165	.18
Sodium Silicofluoride	.0675	.06

Acetone — Consumers were said to be holding purchases to immediate requirements. Compared with 1931, shipments are off considerably, but were in larger volume in April than they were in March, due principally to a slight pick-up in activity in the automobile centers.

Acid Acetic — Textile operations were curtailed further in April with the result that shipments declined. This condition is expected to prevail for at least the next 60 days until attention is given to fall goods.

Acid Chromic — The competitive position of this commodity has changed very little. Some improvement in activity in the automotive centers resulted in several inquiries, but the total volume is disappointing. Automobile production schedules were increased for May according to reports from the Middle West.

Acid Citric — On April 1 domestic producers made a further price reduction. The new level is now 32c. Italian exports of citric acid during 1931 remained at practically the 1930 level in quantity, but the value of the shipments continued the downward trend evident during the past few years. Although calcium citrate shipments also fell in value, there was an increase in the amount shipped in 1931, according to the Department of Commerce. The destinations of Italian exports of citric acid and calcium citrate in 1930 and 1931 were as follows:

Citric Acid Exports

	Quintals 1931	1930
Argentina	1,150	1,988
France	2,351	2,300
Germany	1,062	2,147
Great Britain	6,895	2,199
Spain	1,475	1,558
Other countries	5,279	8,026
Totals	18,212	18,218
Total value (lire)	17,374,554	28,677,940

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Acetaldehyde, drs 1c-1 wks...lb.	.18½	.21	.18½	.21	.18½	.21	.21	.18½
Acetaldol, 50 gal dr.........lb.	.27	.31	.27	.31	.27	.31	.31	.27
Acetamide.................lb.	.95	1.35	.95	1.35	.95	1.35	1.35	1.20
Acetanilid, tech, 150 lb bbl...lb.	.22	.23	.22	.23	.22	.23	.23	.21
Acetic Anhydride, 92-95%, 100 lb cbys..............lb.	.21	.25	.21	.25	.21	.25	.29	.25
Acetin, tech drums..........lb.	.30	.32	.30	.32	.30	.32	.32	.30
Acetone, tanks..............lb.	.....	.10	...	.10	.10	.10½	.12	.11
Acetone Oil, bbls NY......gal..	1.15	1.25	1.15	1.25	1.15	1.25	1.25	1.15
Acetyl Chloride, 100 lb cby...lb.	.55	.68	.55	.68	.55	.68	.68	.55
Acetylene Tetrachloride (see tetrachlorethane).............								
Acids								
Acid Abietic................	.12	.12	.12	.12	.12	.12	.....	.....
Acetic, 28% 400 lb bbls c-1 wks ....100 lb.	.....	2.75	2.40	2.75	2.40	2.60	3.88	2.60
Glacial, bbl c-1 wk....100 lb.	.....	9.14	8.35	9.14	8.35	9.23	13.68	9.23
Glacial, tanks...............	.....	8.89	8.10	8.89	8.10	8.98	13.43	8.98
Adipic.....................	.72	.72	.72	.72	.72	.72	.....	.....
Anthranilic, refd, bbls........lb.	.85	.95	.85	.95	.85	.95	1.00	.85
Technical, bbls............lb.	.65	.70	.65	.70	.65	.80	.80	.75
Battery, cbys...........100 lb.	1.60	2.25	1.60	2.25	1.60	2.25	2.25	1.60
Benzoic, tech, 100 lb bbls....lb.	.35	.45	.35	.45	.35	.45	.53	.40
Boric, powd, 250 lb. bbls. ....lb.	.0425	.05	.0425	.07	.06½	.07¾	.07¾	.06¾
Broenner's, bbls............lb.	1.20	1.25	1.20	1.25	1.20	1.25	1.25	1.20
Butyric, 100% basis cbys....lb.	.80	.85	.80	.85	.80	.85	.90	.80
Camphoric.................lb.	.....	5.25	.....	5.25	.....	5.25	5.25	5.25
Chlorosulfonic, 1500 lb drums wks....................lb.	.04½	.05½	.04½	.05½	.04½	.05½	.05½	.04½
Chromic, 99¾%, drs.........lb.	.13¼	.14½	.13¼	.14½	.14½	.17	.19	.15
Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.00	1.06	1.00	1.06	1.06	1.00
Citric, USP, crystals, 230 lb. bbls....................lb.	.....	.32	.32	.33½	.33½	.43	.59	.40
Cleve's, 250 lb bbls..........lb.	.52	.54	.52	.54	.52	.54	.54	.52
Cresylic, 95%, dark drs NY.gal.	.42	.47	.42	.47	.42	.60	.70	.54
97-99%, pale drs NY.....gal.	.49	.50	.49	.50	.49	.60	.77	.58
Formic, tech 90%, 140 lb. cby....................lb.	.10½	.12	.10½	.12	.10½	.12	.12	.10½
Gallic, tech, bbls............lb.	.60	.70	.60	.70	.60	.70	.55	.50
USP, bbls.................lb.	.....	.74	.....	.74	.....	.74	.74	.74
Gamma, 225 lb bbls wks.....lb.	.75	.77	.75	.80	.77	.80	.80	.77
H, 225 lb bbls wks..........lb.	.60	.65	.60	.65	.60	.70	.70	.65
Hydriodic, USP, 10% soln cby lb.	.....	.67	.....	.67	.....	.67	.67	.67
Hydrobromic, 48%, coml, 155 lb cbys wks.............lb.	.45	.48	.45	.48	.45	.48	.48	.45
Hydrochloric, CP, see Acid Muriatic.................							.....	.....
Hydrocyanic, cylinders wks .lb.	.80	.90	.80	.90	.80	.90	.90	.80
Hydrofluoric, 30%, 400 lb bbls wks.....................lb.	.....	.06	.....	.06	.....	.06	.06½	.06
Hydrofluosilicic, 35%, 400 lb. bbls wks...............lb.	.11	.12	.11	.12	.11	.12	.12	.11
Hypophosphorous, 30%, USP, demijohns ....lb.	.....	.85	.....	.85	.....	.85	.85	.85
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½	.04	.04½	.04	.04½	.05	.04
44%, light, 500 lb bbls.....lb.	.11½	.12	.11½	.12	.11½	.12	.12	.11
Laurent's, 250 lb bbls.......lb.	.36	.42	.36	.42	.36	.42	.42	.36
Linoleic...................lb.	.16	.16	.16	.16	.16	16	.....	.....
Malic, powd, kegs...........lb.	.45	.60	.45	.60	.45	.60	.60	.45
Metanilic, 250 lb bbls.......lb.	.60	.65	.60	.65	.60	.65	.65	.60
Mixed Sulfuric - Nitric.........								
tanks wks..........N unit	.07	.07¼	.07	.07¼	.07	.07½	.07½	.07
tanks wks..........S unit	.008	.01	.008	.01	.008	.01	.01	.008
Monochloroacetic, tech bbl...lb.	.20	.30	.20	.30	.20	.30	.30	.18
Monosulfonic, bbls..........lb.	1.65	1.70	1.65	1.70	1.65	1.70	1.70	1.65
Muriatic, 18 deg, 120 lb cbys c-1 wks...........100 lb.	.....	1.35	.....	1.35	.....	1.35	1.35	1.35
tanks, wks..........100 lb.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
20 degrees, cbys wks...100 lb.	.....	1.45	.....	1.45	.....	1.45	....	1.45
N & W, 250 lb bbls............	.85	.95	.85	.95	.85	.95	.95	.85
Naphthionic, tech, 250 lb......	.60	.65	.60	.65	.60	.65	Nom.	.....
Nitric, 36 deg, 135 lb cbys c-wks...............100 lb.	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
40 deg, 135 lb cbys, c-1 wks................100 lb.	.....	6.00	.....	6.00	.....	6.00	6.00	6.00
Oxalic, 300 lb bbls wks NY....lb.	.11	.11¼	.11	.11½	.10¾	.11½	.11¾	.11
Phosphoric 50%, U. S. P.....lb.	.....	.14	.....	.14	.....	.14	.14	.14
Syrupy, USP, 70 lb drs....lb.	.....	.14	.....	.14	.....	.14	.14	.14
Commercial, tanks......Unit	.....	.80	.....	.80	.....	.80	.80	.80
Picramic, 300 lb bbls........lb.	.65	.70	.65	.70	.65	.70	.70	.65
Picric, kegs................lb.	.30	.50	.30	.50	.30	.50	.50	.30
Pyrogallic, crystals............ ....lb.	1.50	1.60	1.50	1.60	1.50	1.60	1.60	1.30
Salicylic, tech, 125 lb bbl.....lb.	.33	.37	.33	.37	.33	.37	.37	.33
Sulfanilic, 250 lb. bbls.......lb.	.14½	.15	.14½	.16	.15	.16	.16	.15
Sulfuric, 66 deg, 180 lb cbys 1c-1 wks...........100 lb.	1.60	1.95	1.60	1.95	1.60	1.95	1.95	1.60
tanks, wks, ton	.....	15.00	.....	15.00	.....	15.00	15.50	15.00
1500 lb dr wks......100 lb.	1.50	1.65	1.50	1.65	1.65	1.50	1.65	1.50
60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.27½	1.42½	1.42½	1.27½	1.42½	1.27½

GENERAL CHEMICAL COMPANY
REG. U.S. PAT. OFF.

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

Calcium Citrate Exports

	Quintals 1931	1930
Austria	.....	3,580
France	12,261	8,171
Great Britain	1,008	760
Other countries	991	413
Totals	14,260	12,924
Total value (lire)	3,467,838	6,933,903

In 1929, Italy exported 28,037 quintals of citric acid, valued at 46,339,985 lire, and 22,844 quintals of calcium citrate, valued at 14,028,507 lire.

Acid Tartaric — There is apparently no let-up in the competitive situation. A decline in imported quotations was promptly met by a reduction of ½c by domestic manufacturers. The current market is 24c a pound for crystal, powdered or granular.

Alcohol — Prices were well maintained by first hands and consumers were taking fair sized quantities against contract. Spot business was small.

Aluminum Sulfate — Consumers in the water treatment field were moderately increasing requirements, but the paper field was still without any appreciable change. Prices for aluminum sulfate and the various alums were firm and unchanged. The production of aluminum salts in the U. S. in 1931 was 351,071 short tons, valued at $8,736,030, a decrease of six per cent in quantity and of 15 per cent in total value from 1930.

Production in the United States in 1930-1931

1930

Salt	Number of producers reporting	Short tons	Value
Alum:			
Ammonia	5	4,076	$228,986
Potash	3	1,923	104,818
Sodium aluminum sulfate	3	14,787	802,981
Aluminum chloride:			
Liquid	3	3,288	90,731
Crystal	3	583	53,363
Anhydrous	3	11,664	1,208,091
Aluminum sulfate:			
Commercial:			
General	10	305,059	6,649,066
Municipal	9	10,300	172,671
Iron-free	7	18,177	642,247
Other aluminum salts and hydrate	4*	3,194	292,109
	..	373,051	10,245,063

1931

Salt	Number of producers reporting	Short tons	Value
Alum:			
Ammonia	5	4,668	$251,066
Potash	3	2,086	111,168
Sodium aluminum sulfate	3	15,907	905,184
Aluminum chloride:			
Liquid	4	1,588	60,685
Crystal	2 }	5,533	560,175
Anhydrous	3 }		
Aluminum sulfate:			
Commercial:			
General	10	291,875	5,951,392
Municipal	10	11,509	193,450
Iron-free	7	15,108	483,060
Other aluminum salts and hydrate	4*	2,797	219,850
	..	351,071	8,736,030

*1930: Three producers of alumina and one ducer of sodium aluminate; 1931: two producers each of alumina and sodium aluminate.

	Current Market		1932 Low	High	1931 High	Low	1930 High	Low
Oleum, 20%, 1500 lb. drs 1c-1 wks....ton	.....	18.50	.....	18.50	.....	18.50	18.50	18.50
40%, 1c-1 wks net....ton	.....	42.00	.....	42.00	.....	42.00	42.00	42.00
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23	.40	.40	.23
Tartaric, USP, gran. powd, 300 lb bbls....lb.	.24	.24½	.24	.25½	.25½	.29½	.38½	.33
Tobias, 250 lb bbls....lb.	.80	.85	.80	.85	.80	.85	.85	.85
Trichloroacetic bottles....lb.	.....	2.75	.....	2.75	.....	2.75	2.75	2.75
Kegs....lb.	.....	2.00	.....	2.00	.....	2.00	2.00	2.00
Tungstic, bbls....lb.	1.40	1.70	1.40	1.70	1.40	1.70	1.70	1.40
Albumen, blood, 225 lb bbls...lb.	.38	.40	.38	.40	.38	.40	.40	.38
dark....bbls., lb.	.12	.20	.12	.20	.12	20	.20	.12
Egg, edible....lb.	.83	.84	.75	.90	.55	.60	.75	.55
Technical, 200 lb cases...lb.	.62	.66	.62	.66	.48	.66	.73	.50
Vegetable, edible....lb.	.60	.65	.60	.65	.60	.65	.65	.60
Technical....lb.	.50	.55	.50	.55	.50	.55	.55	.50
Alcohol								
Alcohol Butyl, Normal, 50 gal drs c-1 wks....lb.	.....	.123	.123	.1595	.1495	.17¼	.18¼	.17¼
Drums, 1-c-1 wks....lb.	.....	.128	.128	.1645	.1545	.17¾	.18¾	.17¾
Tank cars wks....lb.	.....	.113	.113	.143	.143	.16¾	.17¾	.16¾
Amyl (from pentane) Tanks wks....lb.	.....	.176	.176	.203	.203	.236	.236	.236
Diacetone, 50 gal drs del...gal.	1.42	1.60	1.42	1.60	1.42	1.60	1.60	1.42
Ethyl, USP, 190 pf, 50 gal. bbls....gal.	2.55	2.65	2.55	2.65	2.37	2.75	2.75	2.63
Anhydrous, drums ...gal.	.54	.58	.54	.58	.54	.60	.71	.56
No. 5, *188 pf, 50 gal. drs. drums extra....gal.	.....	.34½	.....	.34½	.27	.44	50	.40
*Tank, cars....gal.	.....	.30½	.....	.30½	.24	.38	.48	.37
Isopropyl, ref, gal drs....gal.	.60	.65	.60	.65	.60	1.00	1.00	.60
Propyl Normal, 50 gal dr..gal.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
Alcotate, tanks....gal.	.....	.60	.....	.60	.60	.60	.....	.....
Aldehyde Ammonia, 100 gal drlb.	.80	.82	.80	.82	.80	.82	.82	.80
Alpha-Naphthol, crude, 300 lb. bbls....lb.	.57	.58	.57	.65	.60	.65	.65	.60
Alpha-Naphthylamine, 350 lb. bbls....lb.	.32	.34	.32	.34	.32	.34	.34	.32
Alum Ammonia, lump, 400 lb. bbls, 1-c-1 wks....100 lb.	3.00	3.25	3.00	3.25	3.00	3.50	3.50	3.20
Chrome, 500 lb casks, wks....100 lb.	4.50	5.25	4.50	5.25	4.50	5.25	5.25	4.50
Potash, lump, 400 lb casks wks....100 lb.	3.00	3.50	3.00	3.50	3.00	3.50	3.50	3.10
Soda, ground, 400 lb bbls wks....100 lb.	3.50	3.75	3.50	3.75	3.50	3.75	3.75	3.50
Aluminum Metal, c-1 NY.100 lb.	22.90	24.30	22.90	24.30	22.90	24.30	24.30	24.30
Chloride Anhydrous ....lb.	.05	.09	.05	.09	.05	.09	.15	.05
Hydrate, 96%, light, 90 lb. bbls....lb.	.16	.17	.16	.17	.16	.17	.18	.16
Stearate, 100 lb bbls....lb.	.20	.21	.20	.21	.18	.22	.26	.19
Sulfate, Iron, free, bags c-1 wks....100 lb.	1.90	1.95	1.90	1.95	1.90	1.95	2.05	1.90
Coml, bags c-1 wks .100 lb.	1.25	1.30	1.25	1.30	1.25	1.30	1.40	1.25
Aminoazobenzene, 110 lb kegs lb.	.....	1.15	.....	1.15	.....	1.15	1.15	1.15
Ammonium								
Ammonia anhydrous Com. tanks	.....	.05¾	.....	.05¾	.....	.05¾	.05¾	.05¾
Ammonia, anhyd. 100 lb cyl...lb.	.15½	.15½	.15½	.15½	.15½	.15½	.15½	.15½
Water, 26°, 800 lb dr del...lb.	.02¾	.03	.02¾	.03	.02¾	.03¼	.03¼	.03¼
Ammonia, aqua 26° tanks....	.....	.02¾	.....	.02¾	.02¾	.02¾	.02¾	.02¾
Acetate....lb.	.28	.39	.28	.39	.28	.39	.39	.28
Bicarbonate, bbls., f.o.b. plant....100 lb.	.....	5.15	.....	5.15	.....	5.15	5.15	5.15
Bifluoride, 300 lb bbls....lb.	.21	.22	.21	.22	.21	.22	.22	.21
Carbonate, tech, 500 lb cs..lb.	.10¼	.12	.10¼	.12	.09	.12	.12	.09
Chloride, white, 100 lb. bbls wks....100 lb.	3.45	5.15	4.45	5.15	4.45	5.15	5.15	4.45
Gray, 250 lb bbls wks...lb.	5.25	5.75	5.25	5.75	5.25	5.75	5.75	5.25
Lump, 500 lb cks spot...lb.	.11	.11½	.11	.11½	.11	.11½	.11½	.11
Lactate, 500 lb bbls....lb.	.15	.16	.15	.16	.15	.16	.16	.15
Ammonium Linoleate....lb.	.15	.15	.15	.15	.15	.....	.....	.....
Nitrate, tech, casks....lb.	.06	.10	.06	.10	.06	.10	.10	.06
Persulfate, 112 lb kegs....lb.	.25	.27½	.25	.27½	.25	.30	.30	.26
Phosphate, tech, powd, 325 lb. bbls....lb.	.11½	.12	.11½	.12	.11½	.12	.13	.11½
Sulfate, bulk c-1....100 lb.	.....	1.30	1.05	1.30	1.10	1.80	2.10	1.75
Southern points....100 lb.	.....	1.25	.....	1.25	1.25	1.75	2.10	1.82½
Nitrate, 26% nitrogen 31.6% ammonia imported bags c.i.f....ton	34.60	35.00	34.60	35.00	34.60	35.00	57.60	45.00
Sulfocyanide, kegs....lb.	.36	.48	.36	.48	.36	.48	.48	.36
Amyl Acetate, (from pentane) Tanks....lb.	.....	.157	.157	.17½	.16	.222	.236	.222
Tech., drs....lb.	.17½	.18	.17½	.18	.16½	.236	.24	.225
Alcohol, see Fusel Oil								
Furoate, 1 lb tins....lb.	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
Aniline Oil, 960 lb drs....lb.	.14½	.16	.14½	.16	.14½	.16	.16	.15
Annatto, fine....lb.	.34	.37	.34	.37	.34	.37	.37	.34
Anthraquinone, sublimed, 125 lb. bbls....lb.	.50	.55	.50	.55	.50	.55	.90	.50
Antimony, metal slabs, ton lots....lb.	.05¾	.06½	.05¾	.06½	.06½	.07½	.09½	.06½
Needle, powd, 100 lb cs....lb.	.08½	.09	.08½	.09	.08½	.09	.09½	.08
Chloride, soln (butter of) cbys....lb.	.13	.17	.13	.17	.13	.17	.17	.13
Oxide, 500 lb bbls....lb.	.08½	.08¾	.08½	.08¾	.08½	.08¾	.08¾	.07½
Salt, 66%, tins....lb.	.22	.24	.22	.24	.22	.24	.24	.22
Sulfuret, golden, bbls ....lb.	.16	.20	.16	.20	.16	.20	.20	.16
Vermillion, bbls....lb.	.38	.42	.38	.42	.38	.42	.42	.38
Archil, conc, 600 lb bbls....lb.	.17	.19	.17	.19	.17	.19	.19	.17
Double, 600 lb bbls....lb.	.12	.14	.12	.14	.12	.14	.14	.12
Triple, 600 lb bbls....lb.	.12	.14	.12	.14	.12	.14	.14	.12
Argols, 80%, casks....lb.	.12½	.13	.12½	.13	.....	.18¾	.18¾	.18¾
Crude, 30%, casks....lb.	.07	.07½	.07	.07½	.07	.08	.08	.07¾

*New formula, prices delivered N. Y.; base price tanks .27½ producing points
*F. O. B. Producing Points

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

The makers of aluminum salts consumed 58,553 long tons of domestic bauxite and 53,549 long tons of imported bauxite, a total of 112,102 tons in 1931, valued at $1,294,700 at consuming works. There was also consumed 2,818 short tons of aluminum hydrate in the manufacture of the salts. Exports of aluminum sulfate from the U. S. in 1931 were 27,668 short tons, valued at $568,490, as compared with 25,255 tons, valued at $573,234, in 1930.

Ammonia Anhydrous — Seasonal expansion was noted by producers. The price situation remains firm and unchanged.

Ammonium Sulfate — Producers of domestic material raised the price to $26 a ton during the month. Interest centered in the hearings in Washington on the question of whether or not foreign producers are "dumping" material in this country. The bulk of this year's requirements has been ordered out and Assistant Secretary Lowman's decision, whatever it is, will apply largely to next season.

Antimony — The market for the metal has shown very little change during the past sixty days. Withdrawals are in relatively small quantities but the price of 5⅜c was adhered to by the leading factors. There was a further decline in both production and export of all antimony products, with trade in 1931 smaller than that of the preceding year, due largely to lack of demand abroad rather than to local factors, according to a report from Vice Consul James B. Pilcher, Hankow, made public by the Department of Commerce. Conditions in Hunan, the producing province, were more settled at the end of the year than for some months previous. The Hankow price of antimony regulus declined during December to the lowest figure of the year, and any improvement in export trade in products will depend largely on an increase in foreign demand. Production of 13,298 long tons of antimony products in 1931 shows a decrease of 9.54 per cent from the 1930 record of 14,700 tons. Changsha stocks at the end of 1931 were reported at 1,570 tons, and those at Hankow at 357 tons. At the end of 1930 stocks were 500 tons at Changsha and 850 at Hankow, the total yearly exports from Changsha, concentration and exporting center of the one antimony producing province, constitute the principal yearly export trade of the district. During 1931 Changsha exported 11,960 long tons of antimony regulus, 1,771 of crude and 995 of oxide, compared with 15,646 of regulus, 2,060 of crude and 1,595 of oxide exported in 1930. These declines amount to 24 per cent, 14 per cent and 38 per cent, respectively. Exports (including re-exports) from Hankow amount-

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Aroclors, wks.........lb.	.20	.40	.20	.40	.20	.40	.40	.20
Arsenic, Red. 224 lb kegs, cs..lb.	.09¾	.10	.09¾	.10	.09¾	.10	.11	.08¾
White, 112 lb kegs.........lb.	.04	.05	.04	.05	.03¾	.05	.04½	.03¾
Asbestine, c-1 wks..........ton	.....	15.00	.....	15.00	.....	15.00	15.00	15.00
Barium								
Barium Carbonate, 200 lb bags wks..........ton	56.50	57.00	56.50	57.00	56.50	60.00	60.00	58.00
Chlorate, 112 lb kegs NY..lb.	.14	.15	.14	.15	.14	.15	.15	.14
Chloride, 600 lb bbl wks...ton	63.00	69.00	63.00	69.00	63.00	69.00	69.00	63.00
Dioxide, 88%, 690 lb drs...lb.	.12	.13	.12	.13	.12	.13	.13	.12
Hydrate, 500 lb bbls.......lb.	.04¾	.05½	.04¾	.05½	.04¾	.05½	.05½	.04¾
Nitrate, 700 lb casks.......lb.	.07¾	.08	.07¼	.08	.07¾	.08½	.08½	.07½
Barytes, Floated, 350 lb bbls wks..........ton	23.00	24.00	23.00	24.00	23.00	24.00	24.00	23.00
Bauxite, bulk, mines........ton	5.00	6.00	5.00	6.00	5.00	8.00	8.00	5.00
Beeswax, Yellow, crude bags..lb.	.22	.24	.22	.24	.22	.31	.34	.24
Refined, cases...........lb.	.25	.28	.25	.28	.25	.37	.38	.37
White, cases.............lb.	.34	.36	.34	.36	.34	.36	.53	.34
Benzaldehyde, technical, 945 lb drums wks.............lb.	.60	.65	.60	.65	.60	.65	.65	.60
Benzene								
Benzene, 90%, Industrial, 8000 gal tanks wks..........gal.	.....	.20	.....	.20	.18	.21	.22	.21
Ind. Pure, tanks works....gal.	.....	.20	.....	.20	.18	.21	.22	.21
Benzidine Base, dry, 250 lb bbls..........lb.	.65	.67	.65	.67	.65	.67	.74	.65
Benzoyl, Chloride, 500 lb drs.lb.	.45	.47	.45	.47	.45	.47	1.00	.45
Benzyl, Chloride, tech drs....lb.	.....	.30	.....	.30	.....	.30	.25	.25
Beta-Naphthol, 250 lb bbl wk.lb.	.....	.22	.....	.22	.22	.24	.24	.22
Naphthylamine, sublimed, 200 lb bbls..........lb.	1.25	1.35	1.25	1.35	1.25	1.35	1.35	1.25
Tech, 200 lb bbls..........lb.	.53	.58	.53	.58	.53	.65	.65	.53
Blanc Fixe, 400 lb bbls wks..ton	60.00	75.00	60.00	80.00	75.00	90.00	90.00	75.00
Bleaching Powder								
Bleaching Powder, 800 lb drs c-1 wks contract.....100 lb.	1.75	2.00	1.75	2.00	1.75	2.35	2.35	2.00
Blood, Dried, fob, NY......Unit	1.50	1.60	1.50	1.90	1.65	3.00	3.90	3.00
Chicago................Unit	1.50	1.60	1.50	1.60	1.50	2.35	4.50	2.75
S. American shipt.......Unit	.....	Nom.	.....	Nom.	2.00	3.20	4.10	3.15
Blues, Bronze Chinese Milori Prussian Soluble........lb.	.....	.35	.....	.35	.....	.35	.35	.35
Bone, raw, Chicago..........ton	21.00	21.50	21.00	21.50	21.00	32.00	39.00	31.00
Bone, Ash, 100 lb kegs.......lb.	.06	.07	.06	.07	.06	.07	.07	.06
Black, 200 lb bbls.........lb.	.05½	.08½	.05½	.08½	.05½	.08½	.08½	.05½
Meal, 3% & 50%, Imp....ton	21.75	22.00	21.00	22.00	21.00	31.00	31.00	31.00
Borax, bags...............lb.	.018	.02	.018	.03½	.02½	.03½	.03½	.02½
Bordeaux, Mixture, 16% pwd..lb.	.11½	.13	.11½	.13	.11½	.13	.14	.12
Paste, bbls..............lb.	.11½	.13	.11½	.13	.11½	.13	.14	.12
Brazilwood, sticks, shpmt....lb.	26.00	28.00	26.00	28.00	26.00	28.00	28.00	26.00
Bromine, cases..............lb.	.36	.43	.36	.43	.36	.43	.47	.38
Bronze, Aluminum, powd blk.lb.	.60	1.20	.60	1.20	.60	1.20	1.20	.60
Gold bulk................lb.	.55	1.25	.55	1.25	.55	1.25	1.25	.55
Butyl, Acetate, normal drs..lb.	.134	.139	.134	.166	.161	.175	.20	.17
Tank, wks...............lb.	.....	.124	.124	.143	.143	.175	.186	.16
Aldehyde, 50 gal drs wks...lb.	.34	.36	.34	.36	.34	.44	.44	.34
Carbitol s ee Diethylene Glycol Mono (Butyl Ether)........	.....	.....	.....	.....	.....	.....	.....	.....
Cellosolve (see Ethylene glycol mono butyl ether)..........								
Furoate, tech., 50 gal. dr., lb.	.....	.50	.....	.50	.....	.50	.50	.50
Propionate, drs...........lb.	.22	.25	.22	.25	.22	.25	.27	.22
Stearate, 50 gal drs........lb.	.25	.25½	.25	.25½	.25	.30	.30	.25
Tartrate, drs.............lb.	.55	.60	.55	.60	.55	.60	.60	.55
Cadmium, Sulfide, boxes.....lb.	.65	.90	.65	.90	.65	.90	1.75	.90
Calcium								
Calcium, Acetate, 150 lb bags c-1..............100 lb.	.....	2.50	2.00	2.50	.....	2.00	4.50	2.00
Arsenate, 100 lb bbls c-1 wks..................lb.	.05½	.06	.05½	.06	.06	.09	.09	.07
Carbide, drs..............lb.	.05	.06	.05	.06	.05	.06	.06	.05
Carbonate, tech, 100 lb bags c-1..................lb.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-1 wks...............ton	.....	21.00	.....	21.00	21.00	22.75	22.75	22.75
Solid, 650 lb drs c-1 fob wks ....ton	.....	18.00	.....	18.00	18.00	20.00	20.00	20.00
Nitrate, 100 lb bags.......ton	34.00	35.00	34.00	35.00	34.00	43.00	43.00	40.00
Peroxide, 100 lb. drs.......lb.	.....	1.25	.....	1.25	.....	1.25	1.25	1.25
Phosphate, tech, 450 lb bbls lb.	.08	.08¾	.08	.08¾	.08	.08¾	.08¾	.08
Stearate, 100 lb bbls.......lb.	.17	.18	.17	.18	.17	.22	.26	.19
Calurea, bags S. points. c.i.f. ton	.....	88.65	.....	88.65	.....	88.65	88.65	88.65
Camwood, Bark, ground bbls..lb.	.....	.18	.....	.18	.....	.18	.18	.18
Candelilla Wax, bags........lb.	.....	.14	.....	.14	.13	.15	.20	.15
Carbitol, (See Diethylene Gycol Mono Ethyl Ether).......	.....	.....	.....	.....	.....	.....	.....	.....
Carbon, Decolorizing, 40 lb bags c-1..................lb.	.08	.15	.08	.15	.08	.15	.15	.08
Black, 100-300 lb cases 1c-1 NY..................lb.	.06	.12	.06	.12	.06	.12	.12	.06
Bisulfide, 500 lb drs 1c-1 NY..................lb.	.05½	.06	.05½	.06	.05½	.06	.06	.05½
Dioxide, Liq. 20-25 lb cyl...lb.	.....	.06	.....	.06	.....	.06	.18	.06
Tetrachloride, 1400 lb drs delivered..............lb.	.06½	.07	.06½	.07	.06½	.07	.07	.06½
Carnauba Wax, Flor, bags....lb.	.26	.28	.26	.28	.26	.28	.37	.28
No. 1 Yellow, bags........lb.	.23	.23½	.21½	.24	.23	.40	.33	.25
No. 2 N Country, bags.....lb.	.....	.16	.14	.16	.15	.23	.27	.20
No. 2 Regular, bags.......lb.	.....	.22	.21	.22	.21	.23	.30	.23
No. 3 N. C..............lb.	.11½	.12	.11	.12	.11	.11	.23	.16
No. 3 Chalky............lb.	.11½	.12	.11	.12	.11	.13½	.23	.16
Casein, Standard, Domestic.... ground..................lb.	.06	.06½	.06	.07½	.06	.10	.15½	.09½

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

ed to 3.281 of regulus, 427 of crude and 270 of oxide in 1931, compared with 4,522 of regulus, 1,516 of crude and 573 of oxide in 1930, making decreases of 27, 72 and 53 per cent, respectively.

Arsenic — Seasonal activity brought about a modest increase in inquiries and sales, but the volume of business is well below the figures for the corresponding month a year ago. Prices are unchanged.

Blanc Fixe — A general reduction of $5 a ton was made in April. The dry by-product material is now quoted at $60-$62.50 a ton and precipitated at $70-$75 a ton, f.o.b. producing points.

Butyl Acetate — A number of the butyl compounds were reduced when producers of butyl alcohol announced lower prices. The new schedule on butyl acetate is as follows: tankcars, 12.4c; carlots drums, 13.4c; less than carlots, 13.9c per pound.

Butyl Alcohol — A sharp reduction was registered early in the month amounting to 3c in tankcars and 2½c in drums. The new schedule is as follows: Tankcars, 11.3c; carlot drums 12.8c; less than carlot quantities, 12.8c. Secondary butyl is now quoted at 9c in tanks; drums carlots, 10c; less than carlots, 10½c.

Butyl Lactate — Quotations were reduced to 29c in drums due to a reduction in butyl Alcohol.

Butyl Stearate — Quotations were reduced to 25c per pound. Increased activity was reported from consuming channels.

Calcium Chloride — A number of the larger seasonal buyers of material for dust-laying purposes have sent in inquiries to leading producers and a small tonnage has already gone forward to some sections of the country. It is thought, however, that 1932 sales for this particular purpose will hardly reach those for 1931. Consumption in refrigeration has been better with many plants preparing for warm weather.

Carnauba Wax — The various grades strengthened as stocks in dealers' hands showed sizable declines. Consumers apparently were exhibiting more interest in the local spot market than in futures.

Shellac — Further weakness developed in several grades, bleached shellac being reduced 2c.

Casein — With demand from paper mills showing no improvement domestic producers were forced to make further concessions and the 20-30 mesh grade reached 6-6½c.

Chlorine — A slight improvement in tonnages moved in April was thought to forecast even better conditions with the

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Cellosolve (see Ethylene glycol mono ethyl ether).........								
Acetate (see Ethylene glycol mono ethyl ether acetate)..								
Celluloid, Scraps, Ivory cs....lb.	.13	.15	.13	.15	.13	.15	.20	.20
Shell, cases...............lb.	.18	.20	.18	.20	.18	.20	.20	.18
Transparent, cases........ lb.	.....	.15	.....	.15	.....	.15	.15	.15
Cellulose, Acetate, 50 lb kegs .lb.	.80	.90	.80	.90	.80	1.25	1.25	.80
Chalk, dropped, 175 lb bbls...lb.	.03	.03¾	.03	.03¾	.03	.03¾	.03¾	.03
Precip, heavy, 560 lb cks...lb.	.02	.03½	.02	.03½	.02	.03½	.03½	.02
Light, 250 lb casks........lb.	.02½	.03½	.02½	.03½	.02½	.03½	.03½	.02½
Charcoal, Hardwood, lump, bulk wks..................bu.	.18	.19	.18	.19	.18	.19	.19	.18
Willow, powd, 100 lb bbl wks....................lb.	.06	.06½	.06	.06½	.06	.06½	.06½	.06
Wood, powd, 100 lb bbls...lb.	.04	.05	.04	.05	.04	.05	.05	04
Chestnut, clarified bbls wks,..lb.	.01¾	.02	.01¾	.02	.01¾	.03	.03	.02¼
25% tks wks.............lb.	.01½	.02¼	.01½	.02¼	.01½	.02¼	.02¼	.01½
Powd, 60%, 100 lb bgs wks.lb.	.....	.04½	.....	.04½	.....	.04½	.04½	.04½
Powd, decolorized bgs wks..lb.	.05½	.06	.05½	.06	.05½	.06	.06	.05½
China Clay, lump, blk mines.ton	8.00	9.00	8.00	9.00	8.00	9.00	9.00	8.00
Powdered, bbls...........lb.	.01¾	.02	.01¾	.02	.01¾	.02	.02	.01¾
Pulverized, bbls wks......ton	10.00	12.00	10.00	12.00	10.00	12.00	12.00	10.00
Imported, lump, bulk.....ton	15.00	25.00	15.00	25.00	15.00	25.00	25.00	15.00
Powdered, bbls...........lb.	.01¾	.03	.01¾	.03	.01¾	.03	.03	.01¾
Chlorine								
Chlorine, cyls lc-1 wks contract ....lb.	.07	.08½	.07	.08½	.07	.08½	.08½	.07
cyls, cl wks,. contract ...lb.	.04	.04½	.04	.04½	.04	.04½	.04½	.04
Liq tank or multi-car lot cyls wks contract............lb.	.01¾	.02¼	.01¾	.02¼	.01¾	.02¼	.025	.01¾
Chlorobenzene, Mono, 100 lb. drs lc-1 wks............lb.	.10	.10½	.10	.10½	.10	.10½	.10½	.10
Chloroform, tech, 1000 lb drs..lb.	.15	.16	.15	.16	.15	.16	.16	.15
Chloropicrin, comml cyls.....lb.	1.00	1.35	1.00	1.35	1.00	1.35	1.35	1.00
Chrome, Green, CP..........lb.	.26	.29	.26	.29	.26	.29	.29	.26
Commercial...............lb.	.06½	.10	.06½	.11	.06½	.11	.11	.06½
Yellow...................lb.	.16	.18	.16	.18	.16	.18	.18	.16
Chromium, Acetate, 8% Chrome bbls....................lb.	.04¾	.05¼	.04¾	.05¼	.04¾	.05¼	.05¼	.04¾
20° soln, 400 lb bbls.....lb.	.....	.05½	.....	.05½	.....	.05½	.05½	.05½
Fluoride, powd, 400 lb bbl..lb.	.27	.28	.27	.28	.27	.28	.28	.27
Oxide, green, bbls.........lb.	.34½	.35½	.34½	.35½	.34½	.35½	.35½	.34½
Coal tar, bbls..............bbl	10.00	10.50	10.00	10.50	10.00	10.50	10.50	10.00
Cobalt Oxide, black, bags....lb.	1.35	1.45	1.35	1.45	1.35	2.22	2.22	2.10
Cochineal, gray or black bag..lb.	.52	.57	.52	.57	.52	.57	1.01	.52
Teneriffe silver, bags.......lb.	.....	.57	.....	.57	.55	.57	.95	.54
Copper								
Copper, metal, electrol....100 lb.	.....	6.12	5.75	7.25	6.25	10.36	17.78	9.50
Carbonate, 400 lb bbls.....lb.	.08½	.16½	.08½	.16½	.08½	.16½	.21½	.08½
Chloride, 250 lb bbls.......lb.	.22	.25	.22	.25	.22	.25	.28	.22
Cyanide, 100 lb drs........lb.	.39	.40	.39	.40	.39	.42	.45	.41
Oxide, red, 100 lb bbls.....lb.	.15	.16	.15	.16	.15	.18	.32	.15½
Sub-acetate verdigris, 400 lb bbls....................lb.	.18	.19	.18	.19	.18	.19	.19	.18
Sulfate, bbls c-1 wks...100 lb.	.....	2.75	2.75	3.10	3.10	4.95	5.50	3.95
Copperas, crys and sugar bulk c-1 wks................ton	.....	14.50	.....	14.50	13.00	14.00	14.00	13.00
Cotton, Soluble, wet, 100 lb bbls....................lb.	.40	.42	.40	.42	.40	.42	.42	.40
Cottonseed, S. E. bulk c-1...ton	.....	26.50	.....	26.50	.....	26.50	.....	.....
Meal S. E. bulk..........ton	.....	.....	.....	.....	.....	.....	.....	.....
7% Amm., bags mills...ton	13.25	38.00	13.25	38.00	13.25	38.00	38.00	37.50
Cream Tartar, USP, 300 lb. bbls....................lb.	.19½	.20½	.19½	.20½	.20½	.24½	.27	.24½
Creosote, USP, 42 lb cbys....lb.	.40	.42	.40	.42	.40	.42	.42	.40
Oil, Grade 1 tanks.......gal.	.11½	.12½	.11½	.12½	.11½	.14	.16	.15
Grade 2...............gal.	.10½	.11½	.10½	.11½	.10½	.12	.14	.13
Grade 3...............gal.	.10½	.11½	.10½	.11½	.10½	.12	.14	.13
Cresol, USP, drums..........lb.	.10½	.11	.10½	.11	.10½	.17	.17	.14
Crotonaldehyde, 50 gal dr....lb.	.32	.36	.32	.36	.32	.36	.36	.32
Cudbear, English............lb.	.16	.17	.16	.17	.16	.17	.17	.16
Cutch, Rangoon, 100 lb bales..lb.	.10	.12	.10	.12	.10	.13	.13	.11
Borneo, Solid, 100 lb bale..lb.	.05½	.07	.05½	.07	.05½	.08½	.08½	.06½
Cyanamide, bags c-1 frt allowed Ammonia unit............	.....	.97½	.....	.97½	.97½	.....	.....	.....
Dextrin, corn, 140 lb bags.100 lb.	3.39	3.45	3.39	3.67	3.47	4.02	4.82	4.42
White, 140 lb bags.....100 lb.	3.34	3.37	3.27	3.37	3.37	4.02	4.77	4.17
Potato, Yellow, 220 lb bgs..lb.	.08	.09	.08	.09	.08	.09	.09	.08
White, 220 lb bags lc-1....lb.	.08	.09	.08	.09	.08	.09	.09	.08
Tapioca, 200 lb bags lc-1...lb.	.08½	.08½	.08½	.08½	.08½	.08¾	.08½	.08
Diamylphthalate, drs wks...gal.	.....	3.80	.....	3.80	.....	3.80	3.80	3.80
Dianisidine, barrels..........lb.	2.35	2.70	2.35	2.70	2.35	2.70	2.70	2.35
Dibutylphthalate, wks.......lb.	.218	.22	.218	.23½	.228	.28	.28	.24½
Dibutyltartrate, 50 gal drs....lb.	.29½	.31½	.29½	.31½	.29½	.31½	.31½	.29½
Dichloroethylether, 50 gal drs lb.	.....	.06	.....	.06	.....	.06	.07	.05
Dichloromethane, drs wks....lb.	.55	.65	.55	.65	.55	.65	.65	.55
Diethylamine, 400 lb drs.....lb.	2.75	3.00	2.75	3.00	2.75	3.00	3.00	2.75
Diethylcarbonate, drs ......gal.	1.85	1.90	1.85	1.90	1.85	1.90	1.90	1.85
Diethylaniline, 850 lb drs.....lb.	.55	.60	.55	.60	.55	.60	.60	.55
Diethyleneglycol, drs........lb.	.14	.16	.14	.16	.14	.16	.13	.10
Mono ethyl ether, drs....lb.	.15	.16	.15	.16	.15	.16	.16	.13
Mono butyl ether, drs....lb.	.24	.30	.24	.30	.24	.30	.30	.24
Diethylene oxide, 50 gal dr....lb.	.....	.50	.....	.50	.....	.50	.50	.50
Diethylorthotoluidin, drs.....lb.	.64	.67	.64	.67	.64	.67	.67	.64
Diethyl phthalate, 1000 lb drums...................lb.	.23	.26	.23	.26	.23	.26	.26	.24
Diethylsulfate, technical, 50 gal drums...................lb.	.30	.35	.30	.35	.30	.35	.35	.30
Dimethylamine, 400 lb drs...lb.	.....	2.62	.....	2.62	.....	2.62	2.62	2.62
Dimethylaniline, 340 lb drs...lb.	.25	.27	.25	.27	.25	.28	.28	.26

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

approach of warmer weather and the necessity for increasing water treatment operations. Withdrawals for the paper trade were still disappointing.

Coaltar Chemicals — Steel activity moved up slightly to about 23 per cent, but by-product coking operations were curtailed again in April in an effort to move the accumulation of coke. Some progress was made in this direction. Stocks of by-product coke on hand at producers' plants at the close of March amounted to 3,473,000 tons, a decrease of 366,000 tons or 9.5 per cent, when compared with the beginning of the month. The decrease occurred principally at merchants plants, where reserves declined 16.6 per cent. At furnace plants the decline was only 2.1 per cent. The cumulative output for the first quarter for coke showed a decided decline in the first quarter, being placed at 33.7 per cent. With coking operations held to a very low figure there has been no opportunity for large stocks of chemicals to accumulate and generally speaking the price structure in this division has undergone the least change of any group in the chemical production field.

Copperas — Continued curtailment in steel mill activity has prevented the accumulation of stocks and prices remain firm.

Copper Sulfate — Producers report a fair amount of agricultural business already booked. The price structure remains firm.

Dibutyl Phthalate — The advance made in this commodity a few months ago was not sustained, leading producers announcing a reduction from 23½c to 21.8c in less than carload quantities.

Glycerine — Fresh declines in all grades of glycerine except c. p., were reported in April. The new quotations as the month closed were as follows: dynamite, 7½c; saponification, 4½c; soap lye 3¾c. These prices are below any quoted in several years. Activity in the soap industry while naturally below normal has not been effected to anything like the same degree as the industries into which glycerine goes. In addition soap producers have in the last few years improved their processes and a much larger number are recovering glycerine. These factors have lead to an accumulation of material which has been unduly increased by present business conditions.

Mercury — The gains made in March were partially lost in April and the quotation for fair sized quantities went from $74.50 to around $68-$69 a flask. In 1931 the U. S. exported 4,984 flasks of mercury

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Dimethylsulfate, 100 lb drs...lb.	.45	.50	.45	.50	.45	.50	.50	.45
Dinitrobenzene, 400 lb bbls...lb.	.15	.16	.15	.16	.15	.16½	.16½	.15½
Dintrochlorobenzene, 400 lb bbls...lb.	.13	.15	.13	.15	.13	.15	.15	.13
Dinitronaphthalene, 350 lb bbls ...lb.	.34	.37	.34	.37	.34	.37	.37	.34
Dinitrophenol, 350 lb bbls....lb.	.23	.24	.23	.24	.29	.30	.32	.31
Dinitrotoluene, 300 lb bbls...lb.	.16	.17	.16	.17	.16	.17	.18	.16
Diorthotolyguanidine, 275 lb bbls wks...lb.	.42	.46	.42	.46	.42	.46	.46	.42
Dioxan (See Diethylene Oxide)	.....	.....	.....	.....	.....	.....	...	.....
Diphenyl...lb.	.20	.40	.20	.40	.20	.40	.50	.20
Diphenylamine...lb.	.34	.37	.34	.37	.37	.38	.40	.38
Diphenylguanidine, 100 lb bbl lb.	.30	.35	.30	.35	.30	.35	.35	.30
Dip Oil, 25%, drums...lb.	.26	.30	.26	.30	.26	.30	.30	.26
Divi Divi pods, bgs shipmt..ton	28.00	29.00	28.00	30.00	28.00	35.00	46.50	35.00
Extract...lb.	.05	.05½	.05	.05½	.05	.05½	.05½	.05
Egg Yolk, 200 lb cases...lb.	.45	.46	.45	.52	.45	.58	.80	.72
Epsom Salt, tech, 300 lb bbls c-1 NY...100 lb.	1.70	1.90	1.70	1.90	1.70	1.90	1.90	1.70
Ether, USP anaesthesia 55 lb. drs. ...lb.	.22	.23	.22	.23	.23	.28	.28	.21
USP (Conc.)...lb.	.09	.10	.09	.10	.09	.10	.....	.....
Ethyl Acetate, 85% Ester, ... tanks...lb.	.....	.09	.....	.09	.06½	.09	.115	.085
drums...lb.	.....	.10	.....	.10	.08	.10	.158	.094
Anhydrous, tanks...lb.	.....	.10	.....	.10	.075	.119	.142	.119
drums...lb.	.....	.10½	.....	.10½	.085	.121	.156	.115
Acetoacetate, 50 gal drs...lb.	.65	.68	.65	.68	.65	.68	.68	.65
Benzylaniline, 300 lb drs...lb.	.88	.90	.88	.90	.88	.90	1.11	.88
Bromide, tech, drums...lb.	.50	.55	.50	.55	.50	.55	.55	.50
Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.85	1.90	1.85	1.90	1.90	1.85
Chloride, 200 lb. drums...lb.	.....	.22	.....	.22	.....	.22	.22	.22
Chlorocarbonate, cbys...lb.	.....	.30	.....	.30	.....	.30	.40	.30
Ether, Absolute, 50 gal drs..lb.	.50	.52	.50	.52	.50	.52	.52	.50
Furoate, 1 lb tins...lb.	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
Lactate, drums works...lb.	.25	.29	.25	.29	.25	.29	.29	.25
Methyl Ketone, 50 gal drs..lb.	.....	.30	.....	.30	.....	.30	.30	.30
Oxalate, drums works...lb.	.45	.55	.45	.55	.45	.55	.55	.45
Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.....	.30½	.....	.30½	.30½	.30½
Ethylene Dibromide, 60 lb dr .lb.	.....	.70	.....	.70	.....	.70	.70	.70
Chlorhydrin, 40%, 10 gal cbys. chloro. cont...lb.	.75	.85	.75	.85	.75	.85	.85	.75
Dichloride, 50 gal drums...lb.	.05	.07	.05	.07	.05	.07	.07	.05
Glycol, 50 gal drs wks...lb.	.25	.28	.25	.28	.25	.28	.28	.25
Mono Butyl Ether drs wks.	.....	.24	.....	.24	.24	.27	.27	.23
Mono Ethyl Ether drs wks	.17	.20	.17	.20	.17	.20	.20	.16
Mono Ethyl Ether Acetate dr. wks...	.19½	.23	.19½	.23	.19½	.23	.23	.19
Mono Methyl Ether, drs.lb.	.21	.23	.21	.23	.21	.23	.23	.19
Stearate...	.18	.18	.18	.18	.18	.18	.....	.....
Oxide, cyl...lb.	.....	2.00	.....	2.00	.....	2.00	2.00	2.00
Ethylidenaniline...lb.	.45	.47½	.45	.47½	.45	.47½	.47½	.45
Feldspar, bulk...ton	15.00	20.00	15.00	20.00	15.00	20.00	25.00	15.00
Powdered, bulk works...ton	15.00	21.00	15.00	21.00	15.00	21.00	21.00	15.00
Ferric Chloride, tech, crystal 475 lb bbls...lb.	.05	.07½	.05	.07½	.05	.07½	.07½	.05
Fish Scrap, dried, wks...unit	.....	3.00&10	.....	3.00&10	3.00&10	4.25&10	4.35&10	3.90&10
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	2.40&50	.....	2.40&50	.....	2.40&50	3.50&50	3.20&50
Fluorspar, 98%, bags...	41.00	46.00	41.00	46.00	41.00	46.00	46.00	41.00

Formaldehyde

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Formaldehyde, aniline, 100 lb. drums...lb.	.37½	.42	.37½	.42	.37½	.42	.42	.37½
USP, 400 lb bbls wks...lb.	.06	.07¾	.06	.07¾	.06	.07¾	.08	.06
Fossil Flour...lb.	.02½	.04	.02½	.04	.02½	.04	.04	.02½
Fullers Earth, bulk, mines..ton	15.00	20.00	15.00	20.00	15.00	20.00	20.00	15.00
Imp. powd c-1 bags...ton	24.00	30.00	24.00	30.00	24.00	30.00	30.00	24.00
Furfural (tech.) drums, wks..lb.	.....	.10	.....	.10	.....	.10	.15	.10
Furfuramide (tech) 100 lb dr..lb.	.....	.30	.....	.30	.....	.30	.30	.30
Furfuryl Acetate, 1 lb tins...lb.	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
Alcohol, (tech) 100 lb dr...lb.	.....	.50	.....	.50	.....	.50	.50	.50
Furoic Acid (tech) 100 lb dr...lb.	.....	.50	.....	.50	.....	.50	.50	.50
Fusel Oil, 10% impurities...gal.	.. ..	1.35	.....	1.35	.....	1.35	1.35	1.35
Fustic, chips...lb.	.04	.05	.04	.05	.04	.05	.05	.04
Crystals, 100 lb boxes...lb.	.18	.20	.18	.20	.18	.22	.22	.20
Liquid, 50°, 600 lb bbls...lb.	.07	.08	.07	.08	.07	.10	.10	.09
Solid, 50 lb boxes...lb.	.14	.16	.14	.16	.14	.16	.16	.14
Sticks...ton	25.00	26.00	25.00	26.00	25.00	26.00	26.00	25.00
G Salt paste, 360 lb bbls...lb.	.45	.50	.45	.50	.45	.50	.50	.45
Gall Extract...lb.	.18	.20	.18	.20	.18	.20	.20	.18
Gambier, common 200 lb cs...lb.	.....	.07	.....	.07	.06½	.07	.07	.06
25% liquid, 450 lb bbls...lb.	.08	.10	.08	.10	.08	.10	.10	.08
Singapore cubes, 150 lb bg..lb.	.09½	.09	.09½	.09	.09½	.09	.09	.08½
Gelatin, tech, 100 lb cases...lb.	.45	.50	.45	.50	.45	.50	.50	.45
Glauber s Salt, tech, c-1 wks...100 lb.	1.00	1.70	1.00	1.70	1.00	1.70	1.70	1.00
Glucose (grape sugar) dry 70-80° bags c-1 NY...100 lb.	3.24	3.34	3.24	3.34	3.24	3.34	3.34	3.24
Tanner's Special, 100 lb bags ...100 lb.	.....	3.14	.....	3.14	.....	3.14	3.14	3.14
Glue, medium white, bbls...lb.	.16	.20	.16	.20	.16	.24	.24	.20
Pure white, bbls...lb.	.25	.27	.25	.27	.20	.26	.26	.22
Glycerin, CP, 550 lb drs...lb.	.10¼	.10½	.10¼	.11½	.11¼	.14½	.14½	.12½
Dynamite, 100 lb drs...lb.	.07½	.08	.07½	.09¾	.09	.12¼	.12¼	.11
Saponification, tanks...lb.	.04½	.04¾	.04½	.06¼	.06	.07½	.08	.07½
Soap Lye, tanks...lb.	.03¾	.04	.03¾	.05	.04¾	.07	.07½	.06¾
Graphite, crude, 220 lb bgs...ton	15.00	35.00	15.00	35.00	15.00	35.00	35.00	15.00
Flake, 500 lb bbls...lb.	.06	09	.06	.09	.06	.09	.09	.06

Gums

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Gum Accroides, Red, coarse and fine 140-150 lb bags...lb.	.03¾	.04½	.03¾	.04½	.03¾	.04½	.04½	.03¾
Powd, 150 lb bags...lb.	.06	.06½	.06	.06½	.06	.06½	.06½	.06

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

valued at $433,596, according to figures of the Customs Statistics Section, Bureau of Foreign and Domestic Commerce. This compares with exports of only 114 flasks in 1926, the last year for which separate figures are available. In 1931, moreover, the exports constituted virtually a net surplus of domestic production in excess of domestic consumption as imports were only 549 flasks, most of which represented deliveries under unexpired long-term contracts. While it was known even in 1930 that export business had been resumed after being virtually nonexistent for many years, trade estimates generally placed the 1931 total at far below the actual figure of nearly 5,000 flasks. Approximately one-half of the total exports was shipped to Europe—Germany being the largest purchaser. Asia accounted for nearly one-third; shipments to Hongkong being exceeded only by those to Germany. North American countries took only 856 flasks, most of which went to Canada. Mexico was formerly a fairly important market for quicksilver but it has become an exporter of the metal during the last year or two.

Mixed Fertilizers — As was fully expected by the fertilizer industry sales have declined in the present season very materially from even the 1931 level. Fortunately for the industry as a whole, production has been held down to a level somewhere near actual demand and there has been no necessity for "dumping" material regardless of price. According to figures compiled by the National Fertilizer Association from reports furnished by State officials, March tag sales in the thirteen Southern States and three Mid-western States were only 48 per cent of the sales for last March, 35 per cent of the sales for March, 1930, and about 60 per cent of the sales for March, 1921. The consumption of fertilizer in the U. S. during 1921 was slightly under 5,000,000 tons; in 1930 the total consumption reached more than 8,000,000 tons, but for 1931 the tonnage was somewhat in excess of 6,000,000 tons. Ordinarily about 36 per cent of the year's tag sales are made in March in the Southern States. During 1931 only about 33 per cent of the year's sales were made in March. Due to the fact that the present season opened very slowly, it is thought, that March sales this year will represent a much smaller proportion of the year's sales than ordinarily witnessed.

Natural Dyestuffs — The market for most items was a very dull routine affair in April. Tanners were unwilling to make future commitments in any sizable

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Yellow, 150-200 lb bags....lb.	.18	.20	.18	.20	.18	.20	.20	.18
Animi (Zanzibar) bean & pea 250 lb cases.............lb.	.35	.40	.35	.40	.35	.40	.40	.35
Glassy, 250 lb cases.......lb.	.50	.55	.50	.55	.50	.55	.55	.50
Asphaltum, Barbadoes (Manjak) 200 lb bags.............lb.	.04	.05	.04	.06	.04½	.12	.12	.09
Egyptian, 200 lb cases.......lb.	.13	.15	.13	.15	.13	.17	.17	.15
Gilsonite Selects, 200 lb bags ....ton	30.50	32.90	30.50	32.90	30.50	32.90	32.90	30.50
Damar Batavia standard 136, lb cases...................lb.	.08½	.09	.08½	.09	.08½	.13	.20	.14
Batavia Dust, 160 lb bags.....lb.	.04	.05	.04	.05½	.05½	.06	.11	.06
E Seeds, 136 lb cases.......lb.	.05½	.06	.05½	.06½	.07	.08	.13	.08
F Splinters, 136 lb cases and bags...................lb.	.05½	.06	.05½	.06	.06½	.07½	.13½	.07
Singapore, No 1, 224 lb cases lb.	.10½	.11	.10½	.11	.10½	.15	.24	.18½
No. 2, 224 lb cases........lb.	.06	.07	.06	.07½	.07	.10	.20½	.13
No. 3, 180 lb bags.........lb.	.04½	.05	.04½	.05	.05	.06	.11½	.07
Benzoin Sumatra, U. S. P. 120 lb cases..................lb.	.21	.22	.21	.22	.23	.34	.40	.33
Copal Congo, 112 lb bags, clean opaque.................lb.	.16½	.17	.16½	.17	.16	.17	.17	.16
Dark, amber.............lb.	.06	.07	.06	.07	.06½	.07½	.08	.07½
Light, amber............lb.	.08½	.09	.08	.09	.08	.14	.14	.12½
Water white.............lb.	•.37	.45	.37	.45	.37	.45	.45	.37
Mastic......................lb.	.36½	.37	.35	.37	.42	.58	.65	.57
Manila, 180-190 lb baskets								
Loba A..................lb.	.09	.10	.09	.11	.11	.13	.17½	.13
Loba B..................lb.	.08	.08½	.08	.08½	.09	.10½	.16½	.13½
Loba C..................lb.	.07	.08	.07	.08	.08½	.10	.14	.10
M A Sorts..............lb.	.04¾	.05	.04¾	.05	.04¾	.06½	.....	.....
D B B Chips.............lb.	.05	.06	.05	.06½	.05½	.08	.....	.....
East Indies chips, 180 lb bags lb.	.04½	.05	.04½	.05½	.05	.05½	.11	.09
Pale bold, 224 lb cs......lb.	.15	.16	.15	.16	.15½	.16	.21	.17½
Pale nubs, 180 lb bags....lb,	.08	.08½	.08	.08½	.08	.09	.16	.12½
Pontianak, 224 lb cases....								
Bold gen No 1.........lb.	.14	.15	.14	.16	.16	.17	.21	.19
Gen chips spot..........lb.	.07	.08	.07	.08	.07	.08½	.15	.13½
Elemi, No. 1, 80-85 lb cs...lb.	.09	.09½	.09	.09½	.10	.12	.14	.12½
No. 2, 80-85 lb cases.....lb.	.08½	.09	.08½	.09	.09½	.11½	.13½	.12
No. 3, 80-85 lb cases.....lb.	.08	.08½	.08	.08½	.08½	.11	.13	.11
Kauri, 224-226 lb cases No. 1	.38	.42	.38	.42	.42	.50	.57	.48
No. 2 fair pale..........lb.	.20	.25	.20	.30	.24	.29	.38	.32
Brown Chips, 224-226 lb cases..............lb.	.10	.12	.10	.12	.10	.12	.12	.10
Bush Chips, 224-226 lb. cases..............lb.	.22	.24	.22	• .24	.28	.34	.40	.38
Pale Chips, 224-226 lb cases ....lb.	.11	.14	.11	.14	.19	.22	.26	.24½
Sandarac, prime quality, 200 lb bags & 300 lb casks...lb.	.23	.24	.23	.24	.18	.22	.40	.27
Helium, 1 lit. bot. ....lit.	.....	25.00	.....	25.00	.....	25.00	25.00	25.00
Hematine crystals, 400 lb bbls lb.	.14	.18	.14	.18	.14	.18	.18	.14
Paste, 500 bbls............lb.	.....	.11	.....	.11	.....	.11	.11	.11
Hemlock 25%, 600 lb bbls wks lb.	.....	.04½	.03	.04½	.03	.03½	.03½	.03
Bark.....................ton	.....	16.00	.....	16.00	.....	16.00	16.00	16.00
Hexalene, 50 gal drs wks......lb.	.....	.30	.30	.40	.40	.60	.60	.60
Hexamethylenetetramine, drs.lb.	.46	.47	.46	.47	.46	.50	.50	.46
Hoof Meal, fob Chicago....unit	.....	1.00	1.00	1.35	1.35	2.50	3.75	2.50
South Amer. to arrive....unit	.....	1.45	1.45	1.65	1.80	2.70	3.75	2.70
Hydrogen Peroxide, 100 vol, 140 lb cbys...............lb.	.20	.21	.20	.21	.21	.24	.26	.21
Hydroxyamine Hydrochloride lb.	.....	3.15	.....	3.15	.....	3.15	3.15	3.15
Hypernic, 51°, 600 lb bbls....lb.	.11	.12	.11	.12	.11	.15	.15	.12
Indigo Madras, bbls.........lb.	1.25	1 30	1.25	1.30	1.25	1.30	1.30	1.28
20% paste, drums.........lb.	.15	18	.15	.18	.15	.18	.18	.15
Synthetic, liquid..........lb.	.....	.12	.....	.12	.....	.12	.12	.12
Iron Chloride, see Ferric or Ferrous								
Iron Nitrate, kegs...........lb.	.09	.10	.09	.10	.09	.10	.10	.09
Coml, bbls..........100 lb.	2.50	3.25	2.50	3.25	2.50	3.25	3.25	2.50
Oxide, English..........lb.	.04	.10	.04	.10	.10	.12	.12	.10
Red, Spanish...........lb.	.02	.03½	.02	.03½	.02½	.03½	.03½	.02½
Isopropyl Acetate, 50 gal drs gal.	.85	.90	.85	.90	.85	.90	.90	.85
Japan Wax, 224 lb cases......lb.	.08	.09	.08	.09	.07¾	.11	.15½	.11½
Kieselguhr, 95 lb bgs NY....... Brown.................ton	60.00	70.00	60.00	70.00	60.00	70.00	70.00	60.00
Lead Acetate, bbls wks...100 lb.	9.00	9.50	9.00	10.00	9.50	11.00	13.50	10.50
White crystals, 500 lb bbls wks...............100 lb.	10.00	10.50	10.00	11.00	10.50	12.25	14.50	11.50
Arsenate, drs 1c-1 wks.....lb.	.10	13	.10	.13	.10	.14	.16	.13
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
Metal, c-1 NY........100 lb.	.....	3.00	3.00	3.75	3.75	4.60	7.75	5.10
Nitrate, 500 lb bbls wks....lb.	.12	.14	.12	.14	.12	.14	.14	.13
Oleate, bbls..............lb.	.17½	.18	.17½	.18	.17½	.18	.18	.17½
Oxide Litharge, 500 lb bbls.lb.	.06¾	.07	.06¼	.07	.06¾	.08	.08¾	.08¼
Red, 500 lb bbls wks....lb.	.06¾	.07	.06¾	.07	.06¾	.08½	.09¾	.08¾
White, 500 lb bbls wks...lb.	.06¼	.07	.06½	.07	.06¼	.08	.09½	.07½
Sulfate, 500 lb bbls wk...lb.	.05¾	.06	.05¾	.06	.05¾	.07	.08¾	.06¾
Leuna saltpetre, bags c.i.f...ton	.....	Nom.	.....	Nom.	.....	57.60	57.60	57.60
S. points c. i. f...........ton	.....	Nom.	.....	Nom.	.....	57.90	57.90	57.90
Lime, ground stone bags.....ton	.....	4.50	.....	4.50	.....	4.50	4.50	4.50
Live, 325 lb bbls wks...100 lb.	.....	1.05	.....	1.05	.....	1.05	1.05	1.05
Lime Salts, see Calcium Salts								
Lime-Sulfur soln bbls........gal.	.15	.17	.15	.17	.15	.17	.17	.15
Lithopone, 400 lb bbls 1c-1 wks ....lb.	.04¾	.05	.04¾	.05	.04¾	.05	.05¾	.04¾
Logwood, 51°, 600 lb bbls.....lb.	.07	.08	.07	.08	.07	.08	.08½	.07
Chips, 150 lb bags.........lb.	.03	.03½	.03	.03½	.03	.03½	.03½	.03
Solid, 50 lb boxes.........lb.	.12	.12½	.12	.12½	.12	.12½	.12½	.12½
Sticks...................ton	24.00	26.00	24.00	26.00	24.00	26.00	26.00	24.00
Lower grades............lb.	.07½	.08	.07½	.08	.07½	.08	.08	.07½
Madder, Dutch.............lb.	.22	.25	.22	.25	.22	.25	.25	.22
Magnesite, calc, 500 lb bbl...ton	50.00	60.00	50.00	60.00	50.00	60.00	60.00	50.00

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

quantities and orders were being filled from dealers stocks in this country. Logwood was the most active member of the group.

Phosphate Rock — The present state of the fertilizer industry has been reflected in the tonnages being shipped from the mining centers of Florida and Tennessee. Prices are being firmly held, however, at current quotations. A diminished superphosphate consumption in Europe during 1931 and a heavy carryover of supplies of rock from peak shipments during 1930 caused an important decline in the 1931 movement of rock from producing countries to European ports. Preliminary statistics of exports from the United States, Tunisia, Morocco, and Algeria would indicate that the Tunisian and Moroccan sales were each off about 900,000 tons.

	1930 Metric Tons	*1931 Metric Tons*
Algeria	765,000	459,000
Morocco	1,779,000	901,000
Tunisia	2,643,000	(a)1,725,000
United States	1,285,000	967,000

(a) Estimate for year based on actual exports of 1,628,772 tons during first 11 months.

Rosin — Prices in both the local and primary markets continued to register further improvement with trading in light volume. Reports from the South are optimistic on the question of reduced production in the new season which started April 1.

Domestic Exports of Naval Stores

		3 mos. ending Mar. 1931	*1932*
Total naval stores, gums and resins		$3,134,778	$2,582,424
Rosin—			
Gum rosin	*Barrels	169,386	233,706
	Value	$1,472,039	$1,377,180
Wood rosin	*Barrels	35,944	30,577
	Value	$329,856	$175,826
Gum spirits of turpentine	Gallons	2,102,346	1,895,849
	Value	$911,904	$706,787
Wood turpentine	Gallons	247,127	94,566
	Value	$103,358	$37,383
Tar and pitch of wood	*Barrels	2,862	1,877
	Value	$29,174	$19,691
Other gums and resins	Pounds	1,199,848	1,268,755
	Value	$288,447	$265,557

*Barrel of 500 lbs.

Potash — Little change was expected in the potash schedule for the next season but sellers had not released the prices as late as May 4. It is probable that they may be the same but that some slight concession may be made in the discounts. To supply the mineral industry promptly with data on potash production and markets during the past year, the following information is furnished by the U. S. Bureau of Mines. Potash produced in the U. S. in 1931 amounted to 133,920 short tons of potassium salts equivalent to 63, 880 short tons of potash (K_2O). Sales by producers amounted to 133,430 tons of

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Magnesium								
Magnesium Carb, tech, 70 lb bags NY...lb.	.06	.06½	.06	.06½	.06	.06½	.06½	.06
Chloride flake, 375 lb. drs c-l wks...ton	35.00	36.00	35.00	36.00	35.00	36.00	36.00	36.00
Imported shipment...ton	31.75	33.00	31.75	33.00	31.75	33.00	33.00	31.75
Fused, imp, 900 lb bbls NY ton	.....	31.00	.....	31.00	.....	31.00	31.00	31.00
Fluosilicate, crys, 400 lb bbls wks...lb.	.10	.10½	.10	.10½	.10	.10½	.10½	.10
Oxide, USP, light, 100 lb bbls...lb.	.....	.42	.....	.42	.....	.42	.42	.42
Heavy, 250 lb bbls...lb.	.....	.50	.....	.50	.....	.50	.50	.50
Peroxide, 100 lb cs...lb.	1.00	1.25	1.00	1.25	1.00	1.25	1.25	1.00
Silicofluoride, bbls...lb.	.09¾	.10¼	.09¾	.10¼	.09¾	.10¼	.10¼	.09¾
Stearate, bbls...lb.	.24	.26	.24	.26	.24	.26	.26	.25
Manganese Borate, 30%, 200 lb bbls...lb.	.....	.19	.....	.19	.....	.19	.19	.19
Chloride, 600 lb casks...lb.	.07½	.08½	.07½	.08½	.07½	.08½	.08½	.07½
Dioxide, tech (peroxide) drs lb.	.03½	.06	.03½	.06	.03½	.06	.06	.03½
Ore, Powdered or granular..								
75-80%, bbls...lb.	.02½	.03	.02½	.03	.02½	.03	.03	.02½
80-85%, bbls...lb.	.....	.03½	.....	.03½	.....	.03½	.03½	.03½
85-88%, bbls...lb.	.04	.04½	.04	.04½	.04	.04½	.04½	.04
Sulfate, 550 lb drs NY...lb.	.07	.08	.07	.08	.07	.08	.08	.07
Mangrove 55%, 400 lb bbls...lb.	.....	.04	.....	.04	.03½	.04	Nom.	.03½
Bark, African...ton	24.75	25.00	24.00	25.00	23.00	29.75	33.00	29.75
Marble Flour, bulk...ton	14.00	15.00	14.00	15.00	14.00	15.00	15.00	14.00
Mercurous chloride...lb.	.....	.93	.....	.93	.93	2.05	2.05	2.05
Mercury metal....... 76 lb flask	68.00	69.00	65.00	74.50	64.00	106.00	124.50	106.00
Meta-nitro-aniline...lb.	.67	.69	.67	.69	.67	.69	.69	.67
Meta-nitro-para-toluidine 200 lb. bbls...lb.	1.40	1.55	1.40	1.55	1.40	1.55	1.55	1.50
Meta-phenylene-diamine 300 lb. bbls...lb.	.80	.84	.80	.84	.80	.84	.84	.80
Meta-toluene-diamine, 300 lb bbls...lb.	.67	.69	.67	.69	.67	.69	69	.67
Methanol								
Methanol, (Wood Alcohol),....								
95%...gal.	.33	.35	.33	.35	.33	.37	.48	.35
97%...gal.	.34	.39	.34	.39	.34	.43	.49	.39
Pure, Synthetic drums cars gal.	.39½	.41½	.39½	.41½	.39½	.42½	.50	.42½
Synthetic tanks...gal.	.....	.35½	.....	.35½	.35½	.40½	.50	.40½
Methyl Acetate, drums...gal.	.. ..	Nom.	.....	Nom.	.....	Nom.	Nom.	Nom.
Acetone,...gal.	.50	.55	.50	.55	50	.70	.77	.65
Anthraquinone,...lb.	.85	.95	.85	.95	.85	.95	.85	.70
Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.....	.....	.....	.....	.....	.....
Chloride, 90 lb cyl...lb.	.45	.45	.45	.45	.45	.45	.45	.45
Furoate, tech., 50 gal. dr., .lb.	.....	.50	.....	.50	.....	.50	.50	.50
Mica, dry grd. bags wks...lb.	65.00	80.00	65.00	80.00	65.00	80.00	80.00	65.00
Wet, ground, bags wks...lb.	110.00	115.00	110.00	115.00	110.00	115.00	115.00	110.00
Michler's Ketone, kegs...lb.	.....	3.00	.....	3.00	.....	3.00	3.00	3.00
Monochlorobenzene, drums see, Chorobenzene, mono...lb.								
Monomethylparaminosufate 100 lb drums...lb.	3.75	4.00	3.75	4.00	3.75	4.00	4.00	3.75
Montan Wax, crude, bags...lb.	.05½	.07	.05½	.07	.05½	.07	.07	.06
Myrobalans 25%, liq bbls...b	.03¾	.04¼	.03¾	.04¼	.03¾	.04¼	.04¼	.03¾
50% Solid, 50 lb boxes...lb.	.05	.05½	.05	.05½	.05	.05½	.05½	.05
J1 bags...ton	34.00	35.00	34.00	35.00	34.00	35.00	41.00	34.00
J 2 bags...ton	18.00	18.50	15.25	18.50	15.50	22.50	26.50	19.75
R 2 bags...ton	16.00	16.50	14.75	16.50	16.00	20.00	27.50	19.00
Naphtha, v. m. & p. (deodorized) bbls...gal.	.12	.14	.12	.14	.12	.18	.16	.16
Naphthalene balls, 250 lb bbls wks...lb.	.....	.04¾	.03¾	.04¾	.03¾	.04¾	.05½	.03¾
Crushed, chipped bgs wks...lb.	.....	.04	.....	.04	.....	.04	.04½	.04
Flakes, 175 lb bbls wks...lb.	.....	.03¾	.....	.03¾	.....	.03¾	.05	.03¾
Nickel Chloride, bbls kegs...lb.	.18	.20	.18	.20	.18	.21	.21	.20
Oxide, 100 lb kegs NY...lb.	.35	.37	.35	.40	.37	.40	.40	.37
Salt bbl. 400 bbls lb NY...lb.	.10½	.13	.10½	.13	.10½	.13	.13	.10½
Single, 400 lb bbls NY...lb.	.10½	.12	.10½	.12	.10½	.12	.13	.10½
Metal ingot...lb.	.35	.35	.35	.35	.35	.....	.....	.....
Nicotine, free 40%, 8 lb tins, cases...lb.	1.25	1.30	1.25	1.30	1.25	1.30	1.30	1.25
Sulfate, 10 lb tins...lb.	.98½	1.20	.98½	1.20	.98½	1.20	1.20	.98½
Nitre Cake, bulk...ton	11.00	12.00	11.00	12.00	12.00	14.00	18.00	12.00
Nitrobenzene, redistilled, 1000 lb drs wks...lb.	.09	.09½	.09	.09½	.09	.09½	.09½	.09
Nitrocellulose, c-l-l-cl, wks...lb.	.25	.36	.25	.36	.25	.36	.36	.25
Nitrogenous Material, bulk..unit	1.35	1.40	1.35	1.55	1.50	2.70	3.40	2.50
Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.....	.25	.....	.25	.25	.25
Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.14	.15	.14	.15	.15	.14
Nutgalls Aleppy, bags...lb.	.....	.18	.....	.18	.16	.18	.16½	.16
Chinese, bags...lb.	.17	.18	.17	.18	.17	.18	.13	.12
Oak Bark, ground...ton	30.00	35.00	30.00	35.00	30.00	35.00	35.00	30.00
Whole...ton	20.00	23.00	20.00	23.00	20.00	23.00	23.00	20.00
Orange-Mineral, 1100 lb casks NY...lb.	.09½	.10	.09½	.10	.10½	.13	.13	.11¾
Orthoaminophenol, 50 lb kgs..lb.	2.15	2.25	2.15	2.25	2.15	2.25	2.25	2.15
Orthoanisidine, 100 lb drs...lb.	2.50	2.60	2.50	2.60	2.50	2.60	2.60	2.50
Orthochlorophenol, drums...lb.	.50	.65	.50	.65	.50	.65	.65	.50
Orthocresol, drums...lb.	.18	.22	.18	.22	.18	.25	.35	.18
Orthodichlorobenzene, 1000 lb drums...lb.	.07	.10	.07	.10	.07	.10	.10	.07
Orthonitrochlorobenzene, 1200 lb drs wks...lb.	.28	.29	.28	.29	.28	.33	.33	.30
Orthonitrotoluene, 1000 lb drs wk...lb.	.16	.18	.16	.18	.16	.18	.18	.16
Orthonitrophenol, 350 lb dr...lb.	.85	.90	.85	.90	.85	.90	90	.85
Orthotoluidine, 350 lb bbl lc-1 lb.	.20	.22	.20	.22	.25	.30	.30	.25

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

potassium salts with an equivalent of 63,770 tons of K_2O. The potash materials of domestic origin sold by producers in 1931 were valued at $3,086,955. About 20,000 tons of potassium salts with an available content of 10,500 tons of K_2O remained in producers' stocks December 31, 1931. The output increased 26.5 per cent in gross weight with an increase of 4 per cent in K_2O content. The sales of salts increased 36 per cent with an increase of 12.6 per cent in K_2O content. The total value of the sales increased 3 per cent. About the same amount of crude salts remained in the hands of producers at the end of 1931 as at the end of 1930. The increase in production was due to the opening of the potash-bearing mine near Carlsbad, N. M. This together with potash obtained from salines in California and from distillery residue from molasses in Maryland formed the greater part of the production in 1931. Alunite was shipped from Sulfur, Nevada, to California, ground and sold as fertilizer, and a small amount was also produced at Maryvale, Utah. Cotton boll ash was also sold as a fertilizer based on its content of water soluble K_2O. The potash salts imported for consumption into the U. S. in 1931, according to the Bureau of Foreign and Domestic Commerce, amounted to 578,657 short tons. The estimated K_2O equivalent of these imports was 215,524 short tons. This represents a decrease of 41 per cent in gross weight from the imports of 1930. The total value of the imports was $16,506,069, which was 33 per cent less than in 1930. The potassium salts imported chiefly for fertilizer amounted to 528,217 tons (K_2O content approximately 194,000 tons), valued at $12,221,990, a decrease of 43 per cent in gross weight and 39 per cent in value. The potassium salts imported for the chemical industry amounted to 50,440 short tons (K_2O equivalent approximately 21,524 short tons), valued at $4,284,079, an increase in gross weight of 10 per cent, but a decrease of 7 per cent in value. The exports of potassium salts amounted to 1,159 short tons of potassium compounds (not fertilizer) valued at $370,935; 31,291 short tons of potassium chloride or muriate, valued at $1,228,584; and 1,169 short tons of other potash fertilizers, valued at $38,525. These figures represent a decrease of 8 per cent in quantity and 26 per cent in value for potassium salts (not fertilizer) and an increase of 90 per cent in quantity and 97 per cent in value for total potash fertilizer material.

Salt Cake — Further weakness was in evidence. Both the glass and paper indus-

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Orthonitroparachlorphenol, tins ....lb.	.70	.75	.70	.75	.70	.75	.75	.70
Osage Orange, crystals.......lb.	.16	.17	.16	.17	.16	.17	.17	.16
51 deg. liquid............lb.	.07	.07½	.07	.07½	.07	.07½	.07½	.07
Powdered, 100 lb bags.....lb.	.14½	.15	.14½	.15	.14½	.15	.15	.14½
Paraffin, refd, 200 lb cs slabs								
123-127 deg. M. P.........lb.	.02⅞	.03	.02⅞	.03	.03¼	.03	.04⅜	.03⅜
128-132 deg. M. P.........lb.	.....	.03¼	.....	.03¼	.03¼	.03¼	.06⅜	.03⅜
133-137 deg. M. P. ....lb.	.04⅛	.04¾	.04⅛	.04¾	.04⅜	.04¾	.07½	.04⅜
Para Aldehyde, 110-55 gal drs..lb.	.20½	.23	.20½	.23	.20½	.23	.23	.20½
Aminoacetanilid, 100 lb bg..lb.	.52	.60	.52	.60	.52	.60	1.05	.52
Aminohydrochloride, 100 lb kegs.................lb.	1.25	1.30	1.25	1.30	1.25	1.30	1.30	1.25
Aminophenol, 100 lb kegs..lb.	.78	.80	.78	.80	.82	.86	1.02	.92
Chlorophenol, drums......lb.	.50	.65	.50	.65	.50	.65	.65	.50
Coumarone, 330 lb drums. lb.	.....	.....	.....	.....	.....	.....	.....	.....
Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.25	2.50	2.25	2.50	2.50	2.25
Dichlorobenzene, 150 lb bbls wks.................lb.	.15½	.16	.15½	.16	.15½	.20	.20	.17
Nitroacetanilid, 300 lb bbls.lb.	.45	.52	.45	.52	.45	.55	.55	.50
Nitroaniline, 300 lb bbls wks ....lb.	.48	.55	.48	.55	.48	.55	.55	.48
Nitrochlorobenzene, 1200 lb drs wks.................lb.	.23	26	.23	.26	.23	.26	.26	.23
Nitro-orthotoluidine, 300 lb bbls.................lb.	2.75	2.85	2.75	2.85	2.75	2.85	2.85	2.75
Nitrophenol 185 lb bbls....lb.	.45	50	.45	.50	.45	.50	.50	.45
Nitrosodimethylaniline, 120 lb. bbls.................lb.	.92	.94	.92	.94	.92	.94	.94	.92
Nitrotoluene, 350 lb bbls....lb.	.29	.31	.29	.31	.29	.31	.31	.29
Phenylenediamine, 350 lb bbls ....lb.	1.15	1.20	1.15	1.20	1.15	1.20	1.20	1.15
Tolueneulfonamide, 175 lb bbls.................lb.	.70	.75	.70	.75	.70	.75	.75	.70
Toluenesulfonchloride, 410 lb bbls wks..............lb.	.20	.22	.20	.22	.20	.22	.22	.20
Toluidine, 350 lb bbls wk...lb.	.42	.43	.42	.43	.40	.44	.40	.38
Paris Green, Arsenic Basis								
100 lb kegs...............lb.	.....	.24	.24	.27	.....	.27	.27	.27
250 lb kegs...............lb.	.....	.23	.23	.25	.25	.26	.25	.25
Persian Berry Ext., bbls.....lb.	.25	Nom.	.25	Nom.	.25	Nom.	Nom.	.25
Pentasol (see Alcohol, Amyl)...								
Pentasol Acetate (see Amyl Acetate)								
Petrolatum, Green, 300 lb bbl.lb.	.02	.02¼	.02	.02¼	.02	.02¼	.02¼	.02
Phenol, 250-100 lb drums.....lb.	.14½	.15	.14½	.15	.14½	.15	.15	.14¾
Phenyl - Alpha - Naphthylamine, 100 lb kegs.............lb.	.....	1.35	.....	1.35	.....	1.35	1.35	1.35
Phenylhydrazine Hydrochloride ....lb.	2.90	3.00	2.90	3.00	2.90	3.00	3.00	2.90
Phosphate								
Phosphate Acid (see Superphosphate)								
Phosphate Rock, f.o.b. mines								
Florida Pebble, 68% basis..ton	3.10	3.25	3.10	3.25	3.10	3.25	3.15	3.00
70% basis.............ton	3.75	3.90	3.75	3.90	3.75	3.90	4.00	3.75
72% basis.............ton	4.25	4.35	4.25	4.35	4.25	4.35	4.50	4.25
75-74% basis..........ton	5.25	5.50	5.25	5.50	5.25	5.50	5.50	5.25
75% basis.............ton	.....	5.75	.....	5.75	.....	5.75	5.75	5.75
77-80% basis..........ton	.....	6.25	.....	6.25	.....	6.25	6.25	6.25
Tennessee, 72% basis.....ton	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
Phosphorous Oxychloride 175 lb cyl.................lb.	.18	.20	.18	.20	.18	.20	.25	.18
Red, 110 lb cases........lb.	.43	.46	.43	.46	.42	.46	.42	.37½
Yellow, 110 lb cases wks..lb.	.31	.37½	.31	.37½	.31	.37½	.37½	.31
Sesquisulfide, 100 lb cs.....lb.	.38	.44	.38	.44	.38	.44	.44	.44
Trichloride, cylinders......lb.	.18	.20	.18	.20	.18	.20	.25	.18
Phthalic Anhydride, 100 lb bbls wks.................lb.	.15	.16	.15	.16	.15	.16	.20	.15
Pigments Metallic, Red or brown bags, bbls, Pa. wks.....ton	37.00	45.00	37.00	45.00	37.00	45.00	45.00	37.00
Pine Oil, 55 gal drums or bbls								
Destructive dist...........lb.	.61	.63	.61	.63	.61	.64	.64	.63
Prime bbls..............bbl.	8.00	10.60	8.00	10.60	8.00	10.60	10.60	8.00
Steam dist. bbls..........gal.	.59	.61	.54	.61	.54	.70	.70	.65
Pitch Hardwood,.............. wks.................ton	35.00	45.00	35.00	45.00	5.00	45.00	45.00	35.00
Plaster Paris, tech, 250 lb bbls ....bbl.	3.30	3.50	3.30	3.50	3.30	3.50	3.50	3.30
Platinum, Refined..........oz.	37.50	38.00	37.50	38.00	38.00	38.00	.....	.....
Potash								
Potash, Caustic, wks, solid...lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾	.06¾	.06½
flake ....lb.	.0705	08	.0705	.08	.0705	.08	.08	.0705
Potash Salts, Rough Kainit								
12.4% basis bulk.......ton	.....	9.20	.....	9.20	.....	9.20	9.20	9.10
14% basis.............ton	.....	9.70	.....	9.70	.....	9.70	9.70	9.60
Manure Salts.................								
20% basis bulk.........ton	.....	12.65	.....	12.65	.....	12.65	12.65	12.50
30% basis bulk.........ton	.....	19.15	.....	19.15	.....	19.15	19.15	18.95
Potassium Acetate..........lb.	.27	.28	.27	.28	.27	.30	.30	.27
Potassium Muriate, 80% basis bags.................ton	.....	37.15	.....	37.15	.....	37.15	37.15	36.75
Pot. & Mag. Sulfate, 48% basis bags.................ton	.....	27.80	.....	27.80	.....	27.80	27.80	27.50
Potassium Sulfate, 90% basis bags.................ton	.....	48.25	.....	48.25	....	48.25	48.25	47.75
Potassium Bicarbonate, USP, 320 lb bbls...............lb.	.07¾	.09	.07¾	.09	.07¾	.10	.10	.09½
Bichromate Crystals, 725 lb casks...............lb.	.08	.08½	.08	.08½	.08	.09	.09¼	.08¾
Powd., 725 lb cks wks....lb.	.13	.13½	.13	13½	.13	.13	.13½	.13

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

tries have been holding commitment down to a minimum with the result that stocks of sizable proportions have accumulated.

Soda Ash — April shipments were just about equal to those in March and considerably below April a year ago. Despite the lack of volume prices are being well maintained in all sections of the country.

Sodium Bichromate — The reductions made in the schedules of both the textile and the tanning trades caused further curtailment in contract withdrawals of bichromate, while the expected improvement in the dry color field did not reach the proportions hoped for. The price structure has steadied, however, and leading producers are quoting 5c for sizable quantities. According to figures supplied to the Association of British Chemical Manufacturers, imports of potassium bichromate into Great Britain and Northern Ireland during February were 1,247 cwt. valued at £2,297. It is interesting to note that the bulk of these supplies, namely 1,000 cwt., came from Russia, the balance being entirely from Germany. The month's imports of bichromate were 4,315 cwt., the U. S. supplying 3,975 cwt., and Germany 340 cwt.

Soda Caustic — Consumers are only taking very limited quantities, but ordering more frequently. Tonnages were off slightly from March and from April a year ago. A slight improvement is expected from the soap industry, but consumption in the textile field is likely to go lower.

Sodium Chlorate — Sellers report a gradual increase in orders as the warmer weather approaches. No change in the price structure has been made in some time and contracts for the current season are on the same basis as last.

Sodium Metasilicate—The use of this material is growing at such a rapid rate that producers are finding a ready market for their entire production. The price is firm at $4.00 per hundred pounds.

Sodium Nitrate — Producers have guaranteed present prices against decline to the end of the present fertilizer season. Imports of sodium nitrate during March totalled only 54 tons compared with more than 120,000 tons in March a year ago and 106,521 tons in March 1930.

Sodium Silicofluoride — The scarcity of material brought about by the increase in the use of this chemical for insecticide purposes resulted in a further price increase. The current quotation as the month closed was 6¾c, but importers and domestic producers were said to be considering the necessity of still higher prices.

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Binoxalate, 300 lb bbls.....lb.	.14	.17	.14	.17	.14	.17	.17	.14
Bisulfate, 100 lb kegs......lb.	.16	.30	.16	.30	.16	.30	.30	.30
Carbonate, 80-85% calc. 800 lb casks..............lb.	.0475	.048	.0475	.05	.04¾	.07¼	.05¾	.05¾
Chlorate crystals, powder 112 lb keg wks...........lb.	.08	.08½	.08	.08½	.08	.08½	.09	.08
Chloride, crys bbls.........lb.	.04	.04¾	.04	.04¾	.04	.06	.06	.05½
Chromate, kegs.............lb.	.23	.28	.23	.28	.23	.28	.28	.23
Cyanide, 110 lb. cases......lb.	.55	.57½	.55	.57½	.55	.57½	.57½	.55
Metabisulfite, 300 lb. bbl...lb.	.11	.13	.11	.13	.11	.13	.13	.12
Oxalate, bbls..............lb.	.20	.24	.20	.24	.20	.24	.24	.20
Perchlorate, casks wks......lb.	.09	.11	.09	.11	.09	.12	.12	.11
Permanganate, USP, crys 500 & 100 lb drs wks.........lb.	.16	.16½	.16	.16½	.16	.16½	.16½	.16
Prussiate, red, 112 lb keg...lb.	.....	.38½	.....	.38½	.35	.40	.40	.38
Yellow, 500 lb casks......lb.	.16½	.17	.16½	.21	.18½	.21	.21	.18½
Tartrate Neut, 100 lb keg..lb.	.....	.21	.....	.21	.....	.21	.21	.21
Titanium Oxalate, 200 lb bbls ....lb.	.21	.23	.21	.23	.21	.23	.23	.21
Propyl Furoate, 1 lb tins.....lb.	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
Pumice Stone, lump bags.....lb.	.04	.05	.04	.05	.04	.05	.05	.04
250 lb bbls.............lb.	.04½	.06	.04½	.06	.04½	.06	.06	.04½
Powdered, 350 lb bags.....lb.	.02½	.03	.02½	.03	.02½	.03	.03	.02½
Putty, commercial, tubs..100 lb.	2.35	2.45	2.35	2.45	2.35	2.45	.03½	.03½
Linseed Oil, kegs......100 lb.	4.00	4.75	4.00	4.75	4.00	4.75	.05½	.05½
Pyridine, 50 gal drums......gal.	1.50	1.75	1.50	1.75	1.50	1.75	1.75	1.50
Pyrites, Spanish cif Atlantic ports bulk..............unit	.12	.13	.12	.13	.12	.13¾	.13¾	.13
Quebracho, 35% liquid tks....lb.	.02¾	.03	.02¾	.03	.02¾	.04	.04	.02¾
450 lb bbls c-1..........lb.	.03½	.03¾	.03½	.03¾	.03½	.03¾	.03¾	.03½
35% Bleaching, 450 lb bbl .lb.	.04	.05½	.04	.05½	.04	.05½	.04½	.05½
Solid, 63%, 100 lb bales cif..lb.	.....	.02½	.....	.02½	.02½	.05½	.05½	.05
Clarified, 64%, bales.....lb.	.....	.03⅛	.....	.03⅛	.03⅛	.05⅛	.05⅛	.05⅛
Quercitron, 51 deg liquid 450 lb bbls.................lb.	.05½	.06	.05½	.06	.05½	.06	.06	.05½
Solid, 100 lb boxes.........lb.	.09½	.13	.09½	.13	.09½	.13	.13	.09½
Bark, Rough...........ton	.....	14.00	.....	14.00	.....	14.00	14.00	14.00
Ground.................ton	34.00	35.00	34.00	35.00	34.00	35.00	35.00	34.00
R Salt, 250 lb bbls wks......lb.	.40	.44	.40	.44	.40	.44	.45	.40
Red Sanders Wood, grd bbls..lb.	.....	.18	.....	.18	.....	.18	.18	.18
Resorcinol Tech, cans........lb.	.65	.70	.65	.70	.65	1.25	1.25	.90
Rosin Oil, 50 gal bbls, first run ....gal.	.43	.45	.43	.45	.47	.58	.58	.56
Second run............gal.	.47	.49	.47	.51	.51	.61	.61	.59

Rosin

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Rosins 600 lb bbls 280 lb...unit ex. yard N. Y.								
B........................	.....	3.60	3.30	3.60	3.25	4.95	7.75	5.35
D........................	.....	3.75	3.40	3.75	3.35	5.50	8.00	5.50
E........................	.....	4.00	3.55	4.00	3.45	5.90	8.17	5.52½
F........................	.....	4.10	3.80	4.10	3.70	6.20	8.45	5.55
G........................	.....	4.15	3.85	4.15	3.75	6.25	8.45	5.60
H........................	.....	4.20	3.90	4.20	3.80	6.30	8.55	5.60
I........................	.....	4.25	3.95	4.25	3.85	6.35	8.58	5.62½
K........................	.....	4.65	4.35	4.65	4.10	6.45	8.65	5.62½
M........................	.....	5.10	4.75	5.10	4.20	6.70	8.80	5.65
N........................	.....	6.05	5.50	6.05	4.85	6.95	8.95	6.05
WG......................	.....	6.10	5.95	6.45	6.15	8.15	9.25	6.85
WW......................	.....	6.25	6.05	6.55	6.45	8.90	9.85	7.85
Rotten Stone, bags mines....ton	24.00	20.00	24.00	20.00	24.00	20.00	30.00	18.00
Lump, imported, bbls......lb.	.05	.07	.05	.07	.05	.07	.07	.05
Selected bbls.............lb.	.09	.12	.09	.12	.09	.12	.12	.09
Powdered, bbls...........lb.	.02	.05	.02	.05	.02	.05	.05	.02
Sago Flour, 150 lb bags......lb.	.04½	.05	.04½	.05	.04½	.05	.05	.04½
Sal Soda, bbls wks.......100 lb.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
Salt Cake, 94-96% c-1 wks. .ton	13.00	14.00	13.00	15.50	14.00	19.00	24.00	15.50
Chrome ....ton	12.00	13.00	12.00	14.50	13.00	17.00	25.00	14.50
Saltpetre, double refd granular 450-500 lb bbls.........lb.	.06½	.06¾	.06½	.06¾	.06	.06¾	.06¾	.06½
Satin, White, 500 lb bbls.....lb	.....	.01½	.....	.01½	.....	.01½	.01½	.01½
Shellac Bone dry bbls........lb.	.19	.20	.19	.26	.26	.29	.47	.28
Garnet, bags..............lb.	.16	.17	.16	.20	.19	.26	.40	.24
Superfine, bags............lb.	.12	.13	.12	.14	.16	.22	.39	.20
T. N. bags...............lb.	.11	.12	.11	.13	.14½	.17	.34	.18
Schaeffer's Salt, kegs.........lb.	.48	.50	.48	.50	.53	.57	.57	.53
Silica, Crude, bulk mines....ton	8.00	11.00	8.00	11.00	8.00	11.00	11.00	8.00
Refined, floated bags......ton	22.00	30.00	22.00	30.00	22.00	30.00	30.00	22.00
Air floated bags........ton	.....	32.00	.....	32.00	.....	32.00	32.00	32.00
Extra floated bags......ton	32.00	40.00	32.00	40.00	32.00	40.00	40.00	32.00
Soapstone, Powdered, bags f. o. b. mines.................ton	15.00	22.00	15.00	22.00	15.00	22.00	22.00	15.00

Soda

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Soda Ash, 58% dense, bags c-1 wks................100 lb.	.....	1.17½	.....	1.17½	.....	1.17½	1.40	1.40
58% light, bags.......100 lb.	.....	1.15	.....	1.15	.....	1.15	1.34½	1.34½
Contract, bags c-1 wks.100 lb.	.....	1.15	....	1.15	1.15	1.15	1.32	1.32
Soda Caustic, 76% grnd & flake drums..............100 lb.	.....	2.90	.....	2.90	.....	2.90	3.35	3.00
76% solid drs.........100 lb.	.....	2.50	.....	2.50	.....	2.50	2.95	2.90
Sodium Acetate, tech....450 lb. bbls wks...............lb.	.04½	.05	.04½	.05	.04½	.06	.05½	.04
Arsenate, drums..........lb.	.25	.35	.25	.35	.25	.35	.19	.18
Arsenite, drums..........gal.	.50	.75	.50	.75	.50	.75	1.00	.50
Bicarb, 400 lb bbl......100 lb.	.....	2.25	.....	2.25	2.35	2.35	2.41	2.41

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

Sulfur — The price situation in this commodity remains unaltered. Producing companies have reduced production schedules sharply to meet the present situation in the fertilizer industry and other consuming fields. Production, shipments, and exports of sulfur in 1931 showed marked decreases in comparison with 1930, according to the U. S. Bureau of Mines. Sulfur production amounted to 2,128,930 long tons, a decrease of 17 per cent from the record output of 2,558,981 tons in 1930. Shipments declined from 1,989,917 tons, valued at about $35,800,000, in 1930, to 1,376,526 tons, valued at $24, 800,000, in 1931, or 31 per cent both in quantity and in value, and were the smallest recorded since 1922. Stocks of sulfur at the mines increased steadily and amounted to 3,250,000 tons on Dec. 31, 1931, a net gain of 753,000 tons for the year. These stocks were approximately 250,000 tons higher than the previous record stocks on hand at the mines at the end of 1923. No imports of sulfur and sulfur ore were recorded by the Bureau of Foreign and Domestic Commerce for the year 1931. Exports of sulfur in 1931 totaled 407,586 long tons, compared with 593,312 tons in 1930, a decrease of 31 per cent. Exports to all the countries that receive important quantities of American sulfur, with the exception of those to France, showed large decreases. Canada received 111,958 tons in 1931, compared with 166,943 tons in 1930; Germany, 82,218 tons, compared with 120,569 tons in 1930; France, 73,457 tons, compared with 56,190 tons; United Kingdom 23,635 tons, compared with 28,683 tons; Australia, 21,362 tons, compared with 65,036 tons; Netherlands, 20,524 tons, compared with 35,073 tons; and New Zealand, 17, 093 tons, compared with 18,212 tons. European countries received 53 per cent of the total quantity exported in 1931, compared with 45 per cent in 1930. Exports of crushed, ground, refined, sublimed and flowers of sulfur in 1931 were 27,197,699 pounds, a decrease from 35, 870,359 pounds in 1930. The principal importing countries were Canada with 6,736,212 pounds, Germany with 4,440,834 pounds, United Kingdom with 3,736,136 pounds, Mexico with 1,784,521 pounds, Australia with 1,700,829 pounds, Greece with 1,619,683 pounds, and Uruguay with 1,334,415 pounds.

Tanning Materials — Business was light in practically all items. The spot price for Sicilian sumac was reduced $2 a ton, Wattle bark $1 a ton and Mangrove bark was advanced 50c a ton. Myrobalans, J2, and R2, were reduced early in the month but recovered in the last week.

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Bichromate, 500 lb cks wks. lb.	.05	.05¾	.05	.05¾	.05	.07½	.07½	.07
Bisulfite 500 lb bbl wks ...lb.	...	.04	.....	.04	.....	.04	.04	.04
Chlorate, ... wks. .lb.	.05¾	.07¾	.05¾	.07¾	.05¾	.07¾	.08	.05¾
Chloride, technical........ton	12.00	13.00	12.00	13.00	12.00	13.00	13.00	12.00
Cyanide, 96-98%, 100 & 250 lb drums wks...........lb.	.16	.17	.16	.17	.16	.17	.20	.16
Fluoride, 300 lb bbls wks...lb.	.07	.07½	.07	.07½	.07	.08½	.09	.08½
Hydrosulfite, 200 lb bbls f. o. b. wks.................lb.	.22	.24	.22	.24	.22	.24	.24	.22
Hypochloride solution, 100 lb cbys.................lb.	.....	.05	.....	.05	.....	.05	.05	.05
Hyposulfite, tech, pea cyrs 375 lb bbls wks......100 lb.	2.40	3.00	2.40	3.00	2.40	3.00	3.00	2.40
Technical, regular crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.40	2.65	2.40	2.65	2.65	2.50
Metanilate, 150 lb bbls... lb.	.44	.45	.44	.45	.44	.45	.45	.44
Metasilicate, c-l, wks...100 lb.	.....	4.00	.....	4.00	.....	4.00	.....	.....
Monohydrate, bbls........lb.	.....	.02½	.....	.02½	.....	.02½	.02½	.02½
Naphthionate, 300 lb bbl...lb.	.52	.54	.52	.54	.52	.54	.57	.52
Nitrate, 92%, crude, 200 lb bags c-1 NY......100 lb.	.....	1.73½	.....	1.73½	1.73½	2.07	2.22½	1.99
Nitrite, 500 lb bbls spot....lb.	.07½	.08	.07½	.08	.07½	.08	.08	.07
Orthochlorotoluene, sulfonate, 175 lb bbls wks.......lb	.25	.27	.25	.27	.25	.27	.27	.25
Perborate, 275 lb bbls.....lb.	.1b	.20	.18	.20	.18	.20	.20	.18
Phosphate, di-sodium, tech. 310 lb bbls.......100 lb.	2.65	2.75	2.65	2.75	2.50	3.00	3.25	2.65
tri-sodium, tech, 325 lb bbls................100 lb.	.....	3.20	.....	3.20	3.15	3.50	4.00	3.25
Picramate, 100 lb kegs.....lb.	.69	.72	.69	.72	.69	.72	.72	.69
Prussiate, Yellow, 350 lb bbl wks.................lb.	.11½	.12	.11½	.12	.11½	.12	12½	.11½
Pyrophosphate, 100 lb keg..lb.	.15	.20	.15	.20	.15	.20	.20	.15
Silicate, 60 deg 55 gal drs, wks ....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70	1.70	1.6
40 deg 55 gal drs, wks ....100 lb.	.....	.75	.....	.75	.75	1.00	.80	.70
Silicofluoride, 450 lb bbls NY ....lb.	.....	.06¾	.05½	.06¾	.04	.04¾	.05½	.04
Stannate, 100 lb drums....lb.	.17½	.18	.17½	.19	.18	.26	.43	.24
Stearate, bbls.............lb.	.20	.25	.20	.25	.20	.25	.29	.20
Sulfanilate, 400 lb bbls.....lb.	.16	.18	.16	.18	.16	.18	.18	.16
Sulfate Anhyd, 550 lb bbls c-1 wks..............lb.	.02	.02¾	.02	.02¾	.02	.02¾	.02¾	.02½
Sulfide, 80% crystals, 440 lb bbls wks..............lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾	.02¾	.02½
62% solid, 650 lb drums 1c-1 wks.............lb.	.03	.03½	.03	.03½	.03	.03½	.03½	.03
Sulfite, crystals, 400 lb bbls wks.................lb.	.03	.03½	.03	.03½	.03	.03½	.03½	.03
Sulfocyanide, bbls.........lb.	.28	.35	.28	.35	.23	.35	.35	.28
Tungstate, tech, crystals, kegs ....lb.	.80	.88	.80	.88	.80	.88	.88	.81
Solvent Naphtha, tanks....... wks..................gal.	.26	.28	.26	.28	.24	.38	.40	.30
Spruce, 25% liquid, bbls.....lb.	.....	.01	.....	.01	.01	.01½	.01½	.01½
25% liquid, tanks wks.....lb.	.....	.01	.....	.01	.....	.01	.01	.01
50% powd, 100 lb bag wks lb.	.02	.02½	.02	.02½	.02	.02½	.02½	.02
Starch, powd., 140 lb bags ....100 lb.	2.44	2.64	2.44	2.67	2.57	3.20	4.02	3.42
Pearl, 140 lb bags.....100 lb.	2.64	2.84	2.64	2.84	2.57	3.00	3.92	3.32
Potato, 200 lb bags........lb.	.04½	.05	.04½	.06	.05½	.06	.06½	.05½
Imported bags..........lb.	.03¾	.03¾	.04	.06½	.05¾	.06½	.06½	.05¾
Soluble...............lb.	.08	.08½	.08	.08½	.08	.08½	.08½	.08
Rice, 200 lb bbls..........lb.	.09	.10	.09	.10	.09	.10	.10	.09
Wheat, thick bags.........lb.	.06½	.07	.06½	.07	.06½	.07	.07	.06½
Thin bags..............lb.	.09½	.10	.09½	.10	.09½	.10	.10	.09½
Strontium carbonate, 600 lb bbls wks..................lb.	.07½	.07½	.07½	.07½	.07½	.07½	.07½	.07½
Nitrate, 600 lb bbls NY....lb.	.07	.07½	.07	.07½	.07	.09½	.09½	.09
Peroxide, 100 lb drs.......lb.	.....	1.25	.....	1.25	.....	1.25	1.25	1.25

Sulfur

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Sulfur Brimstone, broken rock, 250 lb bag c-1.......100 lb.	.....	2.05	.....	2.05	.....	2.05	2.05	2.05
Crude, f. o. b. mines......ton	18.00	19.00	18.00	19.00	18.00	19.00	19.00	18.00
Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.	.....	2.40	.....	2.40	.....	2.40	2.40	2.40
Heavy bags c-1......100 lb.	.....	2.50	.....	2.50	.....	2.50	2.50	2.50
Flowers, 100%, 155 lb bbls c-1 NY..............100 lb.	.....	3.45	.....	3.45	.....	3.45	3.45	3.45
Roll, bbls 1c-1 NY.....100 lb.	2.65	2.85	2.65	2.85	2.65	2.85	2.85	2.65
Sulfur Chloride, red, 700 lb drs wks..................lb.	.05	.05½	.05	.05½	.05	.05½	.05½	.05
Yellow, 700 lb drs wks.....lb.	.03½	.04½	.03½	.04½	.03½	.04½	.04½	.03½
Sulfur Dioxide, 150 lb cyl....lb.	.07	.07½	.07	.07½	.07	.07½	.07½	.07
Extra, dry, 100 lb cyl......lb.	.10	.12	.10	.12	.10	.12	.12	.10
Sulfuryl Chloride.........lb.	.15	.40	.15	.40	.15	.40	.65	.10
Talc, Crude, 100 lb bgs NY...ton	12.00	15.00	12.00	15.00	12.00	15.00	15.00	12.00
Refined, 100 lb bgs NY..ton	16.00	18.00	16.00	18.00	16.00	18.00	18 00	16.00
French, 220 lb bags NY...ton	18.00	22.00	18.00	22.00	18.00	22.00	22.00	18.00
Refined, white, bags....ton	35.00	40.00	35.00	40.00	35.00	40.00	40.00	35.00
Italian, 220 lb bags NY...ton	40.00	50.00	40.00	50.00	40.00	50.00	50.00	40.00
Refined, white, bags....ton	50.00	55.00	50.00	55.00	50.00	55.00	55.00	50.00
Superphosphate, 16% bulk, wks........................ton	7.50	8.00	7.50	8.00	7.50	9.00	9.50	8.00
Triple bulk, wks.........unit	.....	.65	.....	.65	.....	.65	.65	.65
Tankage Ground NY........unit	.....	1.50&10	.....	1.50&10	1.50	3.20&10	4.00&10	3.20&10
High grade f.o.b. Chicago.unit	.....	1.50&10	.....	1.50&10	1.50	3.25&10	3.85&10	3.25&10
South American cif.......unit	.....	2.25&10	.....	2.25&10	2.00	3.40&10	4.25&10	3.40&10
Tapioca Flour, high grade bgs..lb.	.03½	.05	.03½	.05	.03½	.05	.05½	.03
Medium grade, bags.....lb.	.03	04	.03	.04	.03	.04	.04½	.02½
Tar Acid Oil, 15%, drums....gal.	.21	.22	.21	.22	.21	.25	.27	.24
25% drums............gal.	.23	.24	.23	.24	.23	.28	.30	.26

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

Tin Salts — The price of the metal sagged again during the month and brought about a readjustment of prices. The crystals are now quoted at 22c in barrels, and anhydrous at 14.65c. Sodium stannate declined to 16½c. The International Tin Committee announced during the month that a further restriction of 20,000 tons is to be placed in effect June 1.

Toluene — The shortage in stocks of toluene continued through April but no increase in price was made.

Intermediates — Demand was not heavy, but with the present limited production, the market remained in a firm position.

Turpentine — The rapid increase in price in the last two weeks of February and the month of March was halted abruptly in April. Stocks are moving out in a fairly satisfactory manner. In the first three months of 1932 1,895,849 gallons were exported as against 2,102,346 gallons in the same period a year ago. While this is a decline it is not as large as was expected in most quarters at the beginning of the current year.

Superphosphate — Prices have been maintained at firm levels despite the decline in demand. This has been helped by a very material reduction in schedules for the past six or eight months. The National Fertilizer Association announces that production of superphosphate in the U. S. during February was 24 per cent less than for February, 1931; the Northern area showing a reduction of 35 per cent and the Southern area a reduction of 12 per cent. Production for February, 1932, was about 5 per cent less than the production for January, 1932. Production for January-February was 31 per cent less than for January-February of the previous season. Shipments of superphosphate to consumers, dealers, etc., for February were 35 per cent less than those for February, 1931. Superphosphate in base and mixed goods shipped to mixers, other acidulators and consumers, dealers, etc., during February was 49 per cent less than for February, 1931. Shipments of superphosphate to consumers, dealers, etc., for the two months, January-February, were 44 per cent less than the shipments for the same months of the previous season. Stocks on hand February 29 were 25 per cent less than on that date a year ago. The Northern area showed a decrease of 18 per cent and the Southern area showed a decrease of 29 per cent. Stocks on hand increased 3 per cent during February. During last February stocks decreased less than 1 per cent.

	Current Market		1932		1931		1930	
			Low	High	High	Low	High	Low
Terra Alba Amer. No. 1, bgs or bbls mills..........100lb.	1.15	1.75	1.15	1.75	1.15	1.75	1.75	1.15
No. 2 bags or bbls...100lb.	1.50	2.00	1.50	2.00	1.50	2.00	2.00	1.50
Imported bags.............lb.	.01⅛	.01½	.01⅛	.01½	.01⅛	.01½	.01½	.01⅛
Tetrachlorethane, 50 gal dr...lb.	.09	.09½	.09	.09½	.09	.09½	.09½	.09
Tetralene, 50 gal drs wks.....lb.	.....	.20	.....	.20	.....	.20	.20	.20
Thiocarbanilid, 170 lb bbl....lb.	.25	.28½	.25	.28½	.25	.28½	.28½	.22
Tin..........................								
Crystals, 500 lb bbls wks...lb.	.23½	.24	.23½	.24	.23	.28½	.34	.25
Metal Straits NY.........lb.	.....	.22¼	.21⅞	.22¼	.21¾	.27	.38	.26
Oxide, 300 lb bbls wks.....lb.	.....	.23	.....	.23	.23	.29	.42	.25
Tetrachloride, 100 lb drs wks ....lb.	.....	.165	.....	.165	.1605	.19½	.20½	.18½
Titanium Dioxide 300 lb bbl..lb	.20½	.21	.20½	.21	.20½	.22	.50	.21
Pigment, bbls...........lb.	.06½	.07¾	.06½	.07¾	.06½	.07¾	.07¾	.06½
Toluene, 110 gal drs.........gal.	.....	.35	.....	.35	.34	.35	.40	.35
8000 gal tank cars wks....gal.	.....	.30	.....	.30	.27	.30	.35	.30
Toluidine, 350 lb bbls........lb.	.88	.89	.88	.89	.88	.94	.94	.90
Mixed, 900 lb drs wks.....lb.	.27	.32	.27	.32	.27	.32	.32	.27
Toner Lithol, red, bbls.......lb.	.90	.95	.90	.95	.90	.95	.95	.90
Para, red, bbls............lb.	.....	.80	.....	.80	.....	.80	.80	.80
Toluidine ....lb.	1.50	1.55	1.50	1.55	1.50	1.55	1.55	1.50
Triacetin, 50 gal drs wks.....lb.	.32	.36	.32	.36	.32	.36	.36	.32
Trichlorethylene, 50 gal dr...lb.	.10	.10½	.10	.10½	.10	.10½	.10½	.10
Triethanolamine, 50 gal drs...lb.	.40	.42	.40	.42	.40	.42	.42	.40
Tricresyl Phosphate, drs.....lb.	.25½	.26	.25½	.26	.26	.45	.45	.33
Triphenyl guanidine.........lb.	.58	.60	.58	.60	.58	.60	.60	.58
Phosphate, drums.........lb.	.50	.65	.50	.65	.50	.70	.70	.60
Tripoli, 500 lb bbls......100 lb.	.75	2.00	.75	2.00	.75	2.00	2.00	1.75
Tungsten, Wolframite,..per unit	11.00	11.75	11.00	11.75	11.00	11.75	.....	.....
Turpentine carlots, bbls.....gal.	.....	.41¼	.39	.41¼	.36½	.57	.61½	.41
Wood Steam dist. bbls....gal.	.44	.45	.44	.45	.38	.61	.52	.36
Urea, pure, 112 lb cases......lb	.15	.17	.15	.17	.15	.17	.17	.15
Fert. grade, bags c.i.f.....ton	.....	82.60	.....	82.60	.....	82.60	108.00	108.00
c. i. f. S. points.........ton	.....	82.60	.....	82.60	.....	82.60	109.30	109.30
Valonia Beard, 42%, tannin bags..................ton	32.00	32.50	32.00	34.00	33.00	40.00	40.00	39.50
Cups, 30-31% tannin.....ton	22.50	23.50	22.50	23.50	22.50	25.00	27.00	24.00
Mixture, bark, bags.......ton	25.00	26.00	25.00	26.00	25.00	31.00	32.50	30.00
Vermillion, English, kegs....lb..	1.53	1.80	1.53	1.80	1.53	1.80	2.05	1.75
Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
Wattle Bark, bags..........ton	29.00	33.00	29.00	33.00	32.00	41.00	47.75	40.00
Extract 55%, double bags ex-dock..................lb.	.05	.06½	.05	.06½	.05	.06½	.06½	.05⅞
Whiting, 200 lb bags, c-1 wks ....100 lb.	.85	1.00	.85	1.00	.85	1.00	1.00	1.00
Alba, bags c-1 NY........ton	.....	13.00	.....	13.00	.....	13.00	13.00	13.00
Gilders, bags c-1 NY...100 lb.	.....	1.35	.....	1.35	.....	1.35	1.35	1.35
Xylene, 10 deg tanks wks. .gal.	.....	.29	.....	.29	.....	.29	.31	.28
Commercial, tanks wks...gal.	.....	.26	.....	.26	.24	.30	.33	.25
Xylidine, crude.............lb.	.36	.37	.36	.37	.36	.37	.38	.37

Zinc

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Zinc Ammonium Chloride powd., 400 lb bbls.........100 lb.	5.25	5.75	5.25	5.75	5.25	5.75	5.75	5.25
Carbonate Tech, bbls NY..lb.	.10½	.11	.10½	.11	.10½	.11	.11	.10½
Chloride Fused, 600 lb drs. wks..................lb.	.05¾	.06	.05¾	.06	.05¾	.06	.06	.05¾
Gran., 500 lb bbls wks.....lb.	.05¾	.06	.05¾	.06	.05¾	.06	.06½	.05¾
Soln 50%, tanks wks...100 lb.	2.25	3.00	2.25	3.00	2.25	3.00	3.00	2.25
Cyanide, 100 lb drums.....lb.	.38	.39	.38	.39	.38	.39	.41	.38
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
Dust, 500 lb bbls c-1 wks...lb.	.0505	.0515	.0505	.0525	.0515	.07	.11	.06
Metal, high grade slabs c-1 NY...............100 lb.	3.195	3.21	3.195	3.22½	3.50	4.45	6.45	4.10
Oxide, American bags wks..lb.	.06½	.07	.06½	.07	.06½	.07	.07¼	.06½
French, 300 lb bbls wks...lb.	.09¾	.11¾	.09¾	.11¾	.09¾	.11¾	.11¾	.09¾
Perborate, 100 lb drs......lb.	.....	1.25	.....	1.25	.....	1.25	1.25	1.25
Peroxide, 100 lb drs.......lb.	.....	1.25	.....	1.25	.....	1.25	1.25	1.25
Stearate, 50 lb bbls........lb.	.18½	.22	.18½	.22	.18½	.23	.26	.20
Sulfate, 400 bbl wks.......lb.	.03	.03½	.03	.03½	.03	.03½	.03½	.03
Sulfide, 500 lb bbls........lb.	.13	.13½	.13	.13½	.13	.16½	.32	.16
Sulfocarbolate, 100 lb keg..lb.	.22	.24	.22	.24	.22	.30	.30	.28
Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.02½	.03	.02½	.03	.03	.02½
Pure kegs................lb.	.45	.50	.45	.50	.45	.50	.50	.45
Semi-refined kegs..........lb.	.08	.10	.08	.10	.08	.10	.10	.08

Oils and Fats

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Castor, No. 1, 400 lb bbls.....lb.	.....	.10¼	.09¼	.10¼	.10	.12	.13½	.11½
No. 3, 400 lb bbls..........lb.	.09¾	.10½	.09¾	.10½	.09½	.11¾	.13	.11
Blown, 400 lb bbls.........lb.	.12	.12½	.12	.12½	.12½	.14	.15	.12
China Wood, bbls spot NY...lb.	.07⅝	.07¾	.07	.07¾	.07	.07½	.13	.07
Tanks, spot NY.........lb.	.06¾	.06⅞	.06	.06⅞	.06	.07	.11⅜	.06
Coast, tanks, ...lb.	.06⅛	.06½	.05⅝	.06½	.05½	.06½	.10⅞	.05½
Cocoanut, edible, bbls NY....lb.	.....	.10¾	.....	.10¾	.....	.10¾	.10¾	.10¾
Ceylon, 375 lb bbls NY....lb.	.04⅛	.04¾	.04⅛	.04¾	.04⅛	.06½	.08¼	.06⅛
8000 gal tanks NY......lb.	.03¾	.03⅞	.03¾	.03⅞	.03⅛	.06	.07	.05½
Cochin, 375 lb bbls NY....lb.	.05⅛	.06	.05⅛	.06	.05⅛	.07	.09¼	.07¼
Tanks NY..............lb.	.04¼	.05	.04¼	.05	.04⅛	.05¾	.08½	.07
Manila, bbls NY...........lb.	.04⅛	.05	.04⅝	.05	.04⅛	.07	.08¼	.06½
Tanks NY..............lb.	.03⅛	.04	.03⅜	.04	.03⅛	.05⅛	.07⅛	.05⅛
Tanks, Pacific Coast.....lb.	.....	.03½	.....	.03½	.03	.05	.07	.05⅛

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - April 1932 $1.61

Zinc Oxide — Chief interest in the market lay in the question as to whether or not the recent price concessions would be carried over in the contracts written for the last half of the year. In most quarters it was expected that the same prices would be offered to the trade.

FATS AND OILS

The decline in the fats and oils group continued unchecked again in April. The fats and oils price index of the National Fertilizer Association showed the largest decline of all of the indices that make up the general index of commodity prices.

Fish Oils — The market in this field was featured by the decline in price for crude Menhadan and leading producers were reported as being willing to do 17c. Prices for whale, cod, and sperm were steady in the face of light trading.

Linseed Oil — The market in this commodity passed through a very quiet month with prices showing but little change but generally lower. Movement of the Argentine crop is reported to be continuing at a very high rate.

Vegetable Oils — Chinawood oil declined during the month due principally to an improvement of conditions abroad eliminating for the moment at least the possibility of interference with regular shipments. Importations during March aggregated 5,260,974 pounds, having a value of $270,036, which compares with 6,971,561 pounds, having a value of $402,131 in March, 1931. Imports for the first quarters of 1931 and 1932 were, respectively, 17,408,897 pounds, valued at $1,075,151, and 13,025,570 pounds, valued at $700,625. Practically all members of the vegetable group were quoted lower. In the final week of the month Chinawood was off ½c, cocoanut ⅛c, corn, crude, in tanks, ⅛c, palm, ⅛c, peanut, crude, in tanks, ⅛c. Importations of the principal vegetable oils during March were as follows:

	Pounds	*Value*
Edible oils:		
Olive, pkgs., less than 40 lbs.	3,304,114	$334,306
Olive, other edible	4,876,993	422,935
Palm kernel	21,140	805
Peanut	218,632	14,397
Other edible	280,922	7,883
Inedible oils:		
Coconut	20,908,963	658,761
Palm	22,867,486	642,580
Inedible oils for mechanical or manufacturing purposes:		
Olive, sulfured or foots	2,533,580	81,573
Olive, other inedible	1,788,013	109,563
Rapeseed, gallons	51,360	15,377
Palm kernel	11,927	529
Sesame	344	26
Rapeseed, gallons	12,615	5,185
Linseed	2,017	100
Soybean	400,186	10,930
Perilla	983,242	39,347

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Cod, Newfoundland, 50gal bbls ....gal.	.....	.30	.....	.30	.26	.48	.56	.46
Tanks NY ....gal.	.28	.30	.28	.30	.24	.45	.62	.48
Cod Liver see Chemicals								
Copra, bags ....lb.	.021	.023	.021	.0235	.0195	.0325	.046	.039
Corn, crude, bbls NY ....lb.	.05¾	.09	.05¾	.09	.05¾	.09	.10	.08⅛
Tanks, mills ....lb.	.03⅝	.03½	.03⅝	.03½	.03⅝	.07½	.08	.06½
Refined, 375 lb bbls NY ....lb.	.06¾	.07	.06¾	.07	.06¾	.10½	.10½	.09⅛
Tanks ....lb.	.08⅛	.08¾	.08⅛	.08¾	.08	.08¾	.10	.08
Cottonseed, crude, mill ....lb.	.03	.03½	.03	.03½	.03	.07	.07½	.06⅛
Degras, American, 50 gal bbls NY ....lb.	.03½	.04	.03½	.04	.03½	.04½	.04½	.03½
English, brown, bbls NY ....lb.	.03⅞	.04	.03⅞	.04	.03⅞	.05	.05	.04½
Light, bbls NY ....lb.	.04	.04½	.04	.04½	.04	.05½	.05½	.05
Dog Fish, Coast Tanks ....gal.	.....	.32	.....	.32	.....	.32	.34	.32

Greases

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Greases, Brown ....lb.	.02	.02½	.02	.02½	.02	.04½	.06⅛	.04
Yellow ....lb.	.02⅛	.03	.02⅛	.03	.02	.05	.07⅛	.03⅞
White, choice bbls NY ....lb	.03¾	.04⅛	.03¾	.04⅛	.03½	.05⅜	.08⅛	.06
Herring, Coast, Tanks ....gal.	.....	Nom.	.....	Nom.	.....	Nom.	.....	.....
Horse, bbls ....lb.	.05½	Nom.	.05½	Nom.	.05½	Nom.	Nom.	.05½
Lard Oil, edible, prime ....lb.	.09¾	.10	.09¾	.10	.10¾	.13	.13⅛	.12½
Extra, bbls ....lb.	.06¾	.07	.06¾	.07	.07	.10	.12	.10
Extra No. 1, bbls ....lb.	.06½	.07	.06½	.07	.06½	.09¾	.11	.09¾
Linseed, Raw, five bbl lots ....lb.	.....	.074	.....	.074	.077	.102	.146	.096
Bbls c-1 spot ....lb.	.....	.066	.....	.066	.069	.098	.142	.092
Tanks ....lb.	.....	.06	.....	.06	.063	.092	.134	.086
Menhaden Tanks Baltimore ....gal.	.17½	.20	.17½	.20	.14	.22	.50	.21
Extra, bleached, bbls NY ....gal.	.38	.40	.38	.40	.38	.53	.70	.52
Light, pressed, bbls NY ....gal.	.33	.34	.33	.34	.33	.38	.64	.36
Yellow, bleached, bbls NY ....gal.	.36	.37	.36	.37	.30	.42	.67	.38
Mineral Oil, white, 50 gal bbls ....gal.	.40	.60	.40	.60	.40	.60	.60	.40
Russian, gal ....gal.	.95	1.00	.95	1.00	.95	1.00	1.00	.95
Neatsfoot, CT, 20° bbls NY ....lb.	.13½	.13½	.13½	.13½	.13½	.16	.17⅛	.16½
Extra, bbls NY ....lb	.06½	.06¾	.06½	.07	.07	.10	.11⅛	.09⅛
Pure, bbls NY ....lb.	.08¾	.09	.08¾	.09	.09½	.12	.13⅛	.11⅛
Oleo, No. 1, bbls NY ....lb.	.06⅝	.07	.06⅝	.07	.06⅝	.08	.12½	.08⅞
No. 2, bbls NY ....lb.	.05⅝	.06	.05⅝	.06	.05¾	.08	.11	.08⅛
No. 3, bbls NY ....lb.	.....	.06¾	.....	.06¾	.06¾	.09	.10½	.09
Olive, denatured, bbls NY ....gal.	.63	.65	.62	.65	.59	.80	1.00	.70
Edible, bbls NY ....gal.	1.65	2.00	1.65	2.00	1.50	2.00	2.00	1.75
Foots, bbls NY ....lb.	.....	.05	.04½	.05	.04½	.06¾	.08	.06
Palm, Kernel, Casks ....lb.	.....	.04⅜	.03⅞	.04⅜	.04⅛	.06½	.08½	.06
Lagos, 1500 lb casks ....lb.	.04	.05	.04	.05	.04	.06	.07¾	.05¾
Niger, Casks ....lb.	.03⅝	.03½	.03⅝	.03½	.03½	.05½	.07½	.05⅛
Peanut, crude, bbls NY ....lb.	.03¾	.04	.03¾	.04	.03⅞	.05	Nom.	.....
Refined, bbls NY ....lb.	.08½	.09	.08½	.09	.08½	.14	.15	.12
Perilla, bbls NY ....lb.	.05¾	.05½	.05¼	.05¾	.05⅛	.11	.14⅛	.10
Tanks, Coast ....lb.	.....	.05	.....	.05	.05	.09	.11½	.08
Poppyseed, bbls NY ....gal.	1.70	1.75	1.70	1.75	1.70	1.75	1.75	1.70
Rapeseed, blown, bbls NY ....gal.	.68	.70	.68	.70	.68	.73	1.00	.74
English, drms. NY ....gal.	.....	.75	.....	.75	.....	.75	.82	.75
Japanese, drms. NY ....gal.	.56	.58	.56	.58	.56	.58	.70	.56
Red, Distilled, bbls ....lb.	.06½	.06⅝	.06½	.07	.07⅛	.09	.10⅛	.08⅛
Tanks ....lb.	.05¾	.06	.05¾	.06	.06½	.08½	.09½	.07¾
Salmon, Coast, 8000 gal tks. ....gal.	.....	.19	.....	.19	.19	.22	.44	.42
Sardine, Pacific Coast tks ....gal.	.17	.17½	.17	.17½	.17	.19	.42	.18
Sesame, edible, yellow, dos ....lb.	.08½	.09	.08½	.09	.08½	.10¾	.12	.09
White, dos ....lb.	.10	.11	.10	.11	.10	.12	.12½	.10
Sod, bbls NY ....gal.	.....	.40	.....	.40	.....	.40	.40	.40
Soy Bean, crude								
Pacific Coast, tanks ....lb.	.03	.03½	.03	.03½	.03⅝	.08	.09½	.07
Domestic tanks, f.o.b. mills, ...lb.	.....	.03	.03	.032	.032	.07	.08½	.07
Crude, bbls NY ....lb.	.04¾	.05	.04¾	.05	.04¾	.08	.10¾	.10
Tanks NY ....lb.	.04½	.04½	.04½	.04½	.04½	.08	.09¾	.09
Refined, bbls NY ....lb.	.058	.06	.058	.06	.058	.09	.13½	.13
Sperm, 38° CT, bleached, bbls NY ....gal.	.68	.70	.68	.70	.68	.85	.85	.84
45° CT, bleached, bbls NY gal.	.63	.65	.63	.65	.63	.80	.80	.79
Stearic Acid, double pressed dist bags ....lb.	.08½	.09	.08½	.09	.08½	.11	.15	.13½
Double pressed saponified bags ....lb.	.07	.07½	.07	.07½	.08	.12	.15½	.14½
Triple, pressed dist bags ....lb	.10¾	.11	.10¾	.11	.11	.14	.17	.15⅛
Stearine, Oleo. bbls ....lb.	.05½	.06	.05½	.06	.05½	.08¾	.09½	.08½
Tallow City, extra loose ....lb.	.03⅛	.03⅜	.03⅛	.03⅜	.02⅞	.04	.07⅜	.04¾
Edible, tierces ....lb.	.03⅞	.04	.03⅞	.04	.03⅞	.06	.09½	.05⅛
Tallow Oil, Bbls, c-1 NY ....lb.	.07	.07½	.07	.07½	.07	.08¾	.11	.08⅛
Acidless, tanks NY ....lb.	.07⅞	.09	.07⅞	.09	.07⅞	.09	.10	.08½
Vegetable, Coast mats ....lb.	.06	Nom.	.06	Nom.	.06½	Nom.	Nom.	.06½
Turkey Red, single bbls ....lb.	.07	.09	.07	.09	.07	.10	.12	.10
Double, bbls ....lb.	.09	.11	.09	.11	.09	.10	.16	.13
Whale, bleached winter, bbls NY ....gal.	.....	.74	.....	.74	.....	.74	.74	.74
Extra, bleached, bbls NY ....gal.	.58	.60	.58	.60	.58	.77½	.76	.76
Nat. winter, bbls NY ....gal.	.53	.55	.53	.55	.53	.72	.73	.73

Index to Advertisers

"We"—Editorially Speaking

John F. Queeny is a consummate chemical salesman. To have him as a special advocate on a tax problem which he has studied many years and upon which he has come to definite conclusions, is a most valuable contribution to the discussion of Federal taxes which we have been carrying forward during the past few months. Like his friend, Senator Smoot, Mr. Queeny is convinced that eventually we shall have to come to a sales tax, and he is anxious that the base of that tax system shall be broad and its provisions simple.

The Slama-Wolf-Jaeger-General Chemical-Selden-American Cyanamid-Chemical Construction, vanadium catalyst patent suit in Pittsburgh last month, was virtually an adjourned meeting of the technical Round Table at the Chemists' Club. Among those present as expert witnesses, observers, and camp followers, were: Whitaker, Grosvenor, Allen, Singmaster, Downs, and Merriam. This pleasant reunion was all strangely reminiscent of the Monsanto-Selden case, with the noteable exception that as yet there has been no joyful adjournment to the Flotilla Club.

Harry L. Derby in charge of all sales of the American Cyanamid group, comprising the distribution of practically every type of industrial and agricultural chemicals, both direct and through local sales agencies, can talk "turkey" about the relationships between distributor and producer with plenty of good hard experience behind his forceful words. He is one of the workingest executives in the chemical industry, for he is not only carrying through an extensive re-organization and consolidation of his own Company's selling efforts but he is also serving the American Manufacturers' Association as Chairman of their Tariff Commission—which is no sinecure.

A few months is but a short portion of forty-four years and this little span separates the long service records of two of the best known local distributors of chemicals in the country. Both A. A. Harrison from up in New England, and Curtis R. Burnett from over in Newark, met recently in New York for the first time, and their contributions to the symposium on the place of the local distributor in the chemical distributing problem is the direct outcome of that friendly encounter. Both recognized leaders in their own territories—both active heads of well known and long established organizations—its curious, isn't it, that each is so eager to learn more facts about costs, methods, and marketings?

George Stanley Robins is an eastern product, born in Brooklyn and educated at Rutgers—who went west before the war, and after sales experience with Churchill, and Barada & Company, was one of the organizers of Thompson, Monroe and Robins which five years later split, and G. S. Robins & Co. was born in 1923. He is a Phi Beta Kappa man, active in A.C.S. circles in St. Louis, who plays tennis instead of golf—three characteristics distinguishing him from the average chemical salesman; and his analysis of the local distribution problem bears the marks of some original and constructive thinking on the part of the man in the front line trenches.

Edward F. Armstrong who reviews the commercial development of hydrogen in a paper originally read before the Royal Society of Arts, is one of the most colorful and distinguished personalities in British chemical circles. His career began as chemist for Huntley & Palmer biscuits, later he was managing director of both Grosfield and Gossage, two of the most distinguished names in British chemical manufacturing circles. In 1925 he took active charge of the affairs of the British Dyestuffs Corp. and continued in that position after its consolidation with Imperial Chemical Industries. Five years ago he became consulting chemist on his own account; today he serves as Chairman of the Association of the British Chemical Manufacturers.

JUNE, 1932

Distribution

More discussion of the problem of tomorrow by chemical leaders of today will appear next month.

Research

Having raised the question of what is it, we are going to try and help define what it is—and why.

Salt Cake

The market situation on nitre cake makes particularly timely, the review of the natural sodium sulphide deposits of our western states.

Vulcanization

A non-technical description of the rubber industry's chief chemical process viewed from the chemical producer's angle.

Add to our own "Ho-Hum" collection. —Ellen Shannon, aged 26, fatally burned, 1870, by the explosion of a lamp filled with Danford's non-explosive fluid.—*Girard, Penn.*

Mr. Yerkes made two very serious oversights in his survey of the new uses for cellophane. Woven belts of this ubiquitous chemical material have appeared on the counters of the "five-and-ten," and the International Shoe Co. is reported from St. Louis shortly to be placing on the market a cellophane shoe for women to be retailed at $7.50 a pair.

Much prominence was given last year to the delivery of chemicals by plane. The novelty of yesterday is but commonplace twelve months hence. Word comes from Werner Lake, Ontario, that producers of cobalt ore have arranged to transport by air 100 tons to the railhead at Minaki because of the difficulties encountered at this time of the year by land transport.

S. Skowronski and M. A. Mosher, co-writers of the article "Metallic Cousins" bring us a message of the strides being made to bring selenium and tellurium out of the stage known as rare into the spotlight of chemical importance. Mr. Mosher has been associated with the Raritan Copper Works, Perth Amboy, N. J. since his graduation from Cornell in 1916 and is now in charge of the Silver Refinery of the company, which includes the plant for the recovery and production of these two rare metals. Mr. Skowronski, graduate of Massachusetts Institute of Technology, class 1904, has been in charge of the Research Department of the Raritan Copper Works since 1912.